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AUTHOR Cox, J. Lamarr; Lane, Carolee
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ABSTRACT

A Personalized System of Instruction (PSI) program for nontraditional adult learners was developed, implemented, and evaluated for the purpose of making recommendations as to the need for and nature of further related research. Proposed program settings were two classes of adult basic education students and one of prison inmates. A case study approach was planned for each selected implementation site with primary emphasis on collection of observational information and collection of some comparison data. Due to internal problems, the prison class was dropped and an alternate setting selected, and actual enrollment was lower than expected. PSI students completed over 100 units of language and mathematics instruction. Almost a grade level increase in reading comprehension was indicated as was more than a grade level increase in both arithmetic computation and problem solving. Researchers also determined questions considered to represent issues for further research for PSI potential for teaching nontraditional adult learners. (Appendixes, amounting to over one-half of the report, include the introductory unit, "What is PSI?"; a sample language unit; practice language mastery demonstration; Instructions for PSI Classroom Manager; Proctor Guide; and sample program forms.) (KLB)

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FINAL REPORT

Evaluation of the Adaptation of the Personalized System of Instruction to Nontraditional Adult Learners

Volume III

PSI Meets ABE

by

J. Lamarr Cox
Carolee Lane

Prepared for

National Institute of Education
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Preface and Acknowledgements

Evaluation of the Adaptation of the Personalized System of Instruction to Nontraditional Adult Learners, the final report of the research conducted by the Research Triangle Institute under NIE Contract Number 400-79-0073, is presented in three volumes:

Volume I, *Executive Summary*
Volume II, *A Synthesis of Research Findings on PSI and on Adult Learning*
Volume III, *PSI Meets ABE*.

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Chapter 1

Background of the Study

The Personalized System of Instruction (PSI) is a self-paced, mastery-oriented system that emphasizes the use of printed instructional materials, immediate feedback, and peer proctors. Lectures generally are reserved for motivational use. PSI has proven to be an exceptionally successful approach to instructing college students; such classes have been conducted in hundreds of settings, in dozens of content areas, and in more than 30 countries; reports of program outcomes generally have indicated an unusually high level of program effectiveness. However, only minimal research has been done on the effectiveness of PSI on adults in settings other than colleges and universities.

The Research Triangle Institute (RTI), under a contract with the National Institute of Education (NIE), has developed and implemented a PSI program for nontraditional adult learners.[1] This research involved a review of PSI as it has been developed for students in traditional academic environments, adaptation of PSI to the needs of a selected group of nontraditional adult students, and an evaluation of that adaptation. The methodology and findings of this research are described in three volumes: Volume I is an executive summary; Volume II reviews particularly pertinent literature and current practices in both PSI and adult education; and this volume describes the development, implementation, and results of the PSI program.

Given the limited level of effort devoted to the study, no conclusive findings regarding the effectiveness of PSI for nontraditional adults were attempted; rather, the primary objective of the study was to answer the question: "Is further investigation of the use of PSI for nontraditional adult learners likely to be worthwhile?" A secondary objective was to identify potentially fruitful areas for further investigation. The initial steps in the current research were, as noted above: (a) to review the literature and practice of PSI with particular attention to implications for the use of PSI with nontraditional adult learners; (b) to review literature on adult learning with emphasis on describing student characteristics and on identifying populations likely to allow a fruitful adaptation of PSI; and (c) to draw some conclusions regarding major factors that should be considered when developing and implementing a PSI program for nontraditional adult learners. The results of these activities are documented in Volume II.

This volume discusses the development, implementation, and evaluation activities carried out to meet the study objective; that is, it describes the PSI program for nontraditional adult learners that was developed, implemented, and evaluated for the purpose of making recommendations as to the need for and nature of further related research. Chapter 2 describes the proposed program setting, Chapter 3 describes the developmental activities and final products of the developed PSI program, Chapter 4 details the proposed research design, Chapter 5 describes the settings actually used in conducting the research, Chapter 6 provides details of the program implementation, Chapter 7 presents the program results, and Chapter 8 presents some conclusions and suggested development and implementation guidelines.

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[1] For purposes of this report "nontraditional adult learner" is defined as an adult who is studying, usually part time, in other than the traditional (e.g., college or university) academic setting.

Chapter 2

The Proposed Program Setting

Two specific subpopulations of adult learners, adult basic education (ABE) students and prison inmates, were described in Volume II, Chapter 3. Both of these groups appeared to be suitable for implementation of a PSI program and both subpopulations appeared to have particularly acute and largely unmet educational needs. Furthermore, the educational needs of most of the prison inmates appeared to be similar to the needs of noninstitutionalized ABE students; that is, the two groups shared a need for instruction in basic subjects such as reading and mathematics. Because of the apparent magnitude of the needs of these groups, a decision was made to develop, implement, and evaluate a PSI/ABE program. Since a specific within-state, public, continuing education institution (hereinafter referred to as the cooperating institution) currently operated an ABE program and was willing to support the proposed research, a decision was made to work with that institution.

This chapter presents a brief description of the proposed program settings to (a) outline the basic classroom and institution characteristics that guided the development of the instructional program, and (b) provide a background for the discussion in Chapter 5 of the actual program settings which differed in several important aspects from the proposed settings described below.

Early developmental activities were intended to determine (a) the specific classes to be used, (b) the characteristics and educational needs of the students in those classes, and (c) the nature and extent of assistance to be provided by the teachers and administrative personnel responsible for the then-current program. These early activities included narrowing the range of possible classes and curricula to fit the scope of the planned research. Early meetings with personnel from the cooperating institution indicated that they operated ten of ongoing ABE classes. These were described generally as: (a) four classes of 10-15 students each which met at off-campus housing authority sites; (b) three classes of 10-15 students each which met at community school sites; (c) one class made up of 10-15 inmates in a prison setting; and (d) two on-campus classes of 10-15 students each.

These classes supposedly met at least twice each week for two-to-three hour sessions. The students were stated to be over the age of 18 and to function at between the fourth and eighth grade level in basic areas such as reading, mathematics, and oral and written communication. The students were predominantly black and approximately 90 percent were females (except in the prison setting where all students were males). The ages of the students ranged from about 18 to 65 with about half in the 30 to 50 age range. Student attendance in these classes was stated to be quite regular, and recruitment of new students was stated to be primarily a matter of finding resources to handle the backlog of students who wished to enter the program.

Following visits to two of these classes, one on-campus class and one housing authority site, a decision was made to use three settings for the PSI implementation. These settings were: (a) the morning on-campus class; (b) one daytime housing authority class; and (c) the prison class. In addition, a decision was made to use the on-campus night class and one of the remaining housing authority classes as comparison groups. The teachers of all of these classes (except for the teacher of the prison class, who was on an extended vacation at the time) were interviewed. The teachers noted the difficulties they were encountering in teaching students with widely differing levels of academic achievement and motivation. The typical approach was to teach the same thing to the entire class at the same time. The teachers were enthusiastic about the possibilities of individualized instruction and self-pacing, and were eager to participate in the program.

The rationale for the above choice of classes was that these choices would provide the maximum number of PSI students that could be handled with the available study resources and also would provide the widest range of classroom characteristics. The rationale for using three settings rather than concentrating on a single setting is presented in Chapter 4. Since all of the off-campus classes, with the exception of the prison class, supposedly were quite similar, only one of these was selected; a day class was selected for the convenience of the researchers. The two on-campus classes supposedly attracted somewhat more advanced students and students who were free to travel some distance to the campus. Again, the day class was selected for the convenience of the researchers. The prison setting was selected because of the obvious basic differences between it and the other settings.

Based on agreements with the cooperating institution's administrative personnel, other expectations from the cooperating institution were: (a) availability of teachers and knowledgeable administrative personnel to review and provide inputs into the selection/development of instructional materials, and the development of the instructional system; (b) availability of teachers for training and for transfer of information during the program implementation; (c) support staff to administer tests and self-concept scales; and (d) reasonable communications between the administrative staff, teachers, and the researchers.

Chapter 3

Development of the PSI Program

This chapter describes the developmental methodology, the rationale for the various developmental decisions, and the resultant instructional system and materials. Section A provides an overview of the instructional system by noting the planned sequence of events and the intended use of the various selected or developed materials. Section B provides details of the developmental activities, descriptions of the discrete products selected or developed for implementing the PSI program, and the rationale for the various developmental decisions.

A. Overview of the Planned Instructional System

The planned instructional system was intended to follow the sequence of events outlined as follows:

(1) Provide training to classroom managers. Training for classroom managers was intended to be a follow-up of earlier planned developmental meetings in which the classroom managers and other appropriate cooperating institution personnel would have played active roles in developing the details of the PSI program. Training was intended to be provided in two or more four-hour sessions prior to the beginning of the PSI implementation. The primary purpose of the planned training sessions was to elaborate on the classroom manager's role in implementing the PSI classroom activities described in the balance of this section. (Since the teacher assigned to each PSI class was intended to be the classroom manager, the terms "teacher" and "classroom manager" often are used interchangeably in this report.)

(2) Provide instructions to proctors. Since the use of internal proctors was planned (i.e., any student who had demonstrated mastery of a particular unit would be eligible to serve as proctor for that unit), no formal training sessions were anticipated. Instead, printed instructions describing the proctor's role were to be provided to the proctors as needed.

(3) Administer placement/assessment instruments. The initial planned activity, other than routine enrollment activities, was to be the administration of an achievement test and a self-concept scale. The purpose of the achievement test administration was to ensure that each student had the basic knowledge required to enter the PSI program (e.g., could read, write, and compute at at least the fourth grade level) and to provide pretest data for use in measuring achievement gains. The initial self-concept scale administration was intended to provide beginning-of-treatment data for use in measuring changes in self-concept. Both the achievement test and the self-concept scale were to be administered by the classroom manager (teacher) to all students enrolling in the three selected PSI classes and in the two selected comparison classes during the first four weeks of the intended six-month implementation period. The achievement test, only, was to be administered to all additional students at the time of enrollment in any of the five classes at any time during the implementation period.

(4) Introduce students to PSI. Those students who appeared, based on achievement test scores, to have both the necessary language knowledge and necessary computation knowledge were intended to be placed in both the language and mathematics portions of the PSI program. Any students who met the entry requirements for language but not for mathematics were intended to be placed in the PSI language program only. All students who entered the PSI program were intended to begin the program by studying, and mastering, a lesson entitled, "What is PSI?" This lesson was intended to provide the students with basic information regarding the program.

(5) Provide instruction. All students who were eligible for the PSI program were to be provided with the first unit (lesson) in either the language or the mathematics series. Assuming a student was eligible for both language and mathematics, he/she was to be encouraged to work through both sets of lessons at about the same rate. However, the final decision as to which set of lessons to study was to be left with the student. For example, if a student were to choose to study only mathematics, he/she was to be permitted to do so.

Both the language series and the mathematics series were to be hierarchical in nature; that is, mastery of one unit would ensure that a student had the prerequisite knowledge to begin the succeeding unit. Thus, when a student mastered one unit, he/she would be eligible to study the next unit in the series. While the units were to be self-instructional, any student needing assistance was to be able to obtain help from a proctor. Any students who were not eligible for the PSI program were to be provided with tutorial services by the classroom manager. The nature of this instruction was to be left to the discretion of the classroom manager.

The role of the classroom manager in the PSI instructional process was intended to be one of (a) acting as proctor when no other proctor was available, or if the proctor was unable to provide the required assistance, (b) maintaining records of student activities, progress, and problems, (c) observing and documenting student-proctor interactions, (d) ensuring the appropriate distribution of instructional materials, (e) requesting assistance from the researchers if any instructional materials appeared to be inadequate or inappropriate, and (f) documenting any deviations from the planned program.

(6) Provide for demonstration of mastery.
Students were to demonstrate mastery of each unit by successfully completing a mastery demonstration instrument which ensured that the objectives of the unit were met. Each mastery demonstration instrument was to be identical in format and general content to a practice mastery demonstration included at the end of each instructional unit. Thus, expectations were that once the student worked his/her way through a unit and successfully completed the self-scoring practice mastery demonstration, he/she could be reasonably certain of success in completing the formal mastery demonstration instrument. The mastery demonstration instruments were to be administered and scored by a proctor. If a student demonstrated mastery, he/she would be permitted to proceed to the next unit; if mastery was not demonstrated, the student would be required to restudy the unit before again attempting to demonstrate mastery.

The classroom manager's role in the mastery demonstration process was to be one of (a) acting as proctor when no other proctor was available, (b) providing first-time proctors with printed instructions regarding the proctor role, and clarifying these instructions as required, (c) ensuring the proper distribution of mastery demonstration materials, (d) maintaining mastery demonstration records, (e) resolving any conflicts between proctors and students as to whether or not mastery was demonstrated, and (f) documenting any deviations from the planned program. The proctor's role was to include (a) obtaining the appropriate mastery demonstration instrument from the classroom manager, (b) ensuring that the student followed the established guidelines when completing the mastery demonstration instrument, (c) scoring the instrument, (d) discussing any area of indicated difficulty with the student, (e) returning the mastery demonstration materials to the classroom manager, and (f) providing students who demonstrated mastery with the instructional materials for the next unit.

(7) Provide motivational activities. To fulfill the "motivational lecture" requirement of the PSI, the presentation of motivational films was planned. These presentations were to be followed by group discussions led primarily by the classroom manager.

(8) Administer end-of-treatment assessment instruments. At the end of the six-month implementation period, the self-concept scale and the alternate form of the achievement test again would be administered to all students in the three PSI classes and the two comparison classes.

B. Details of the Developmental Activities and Products

This section provides details of the developmental activities, descriptions of the discrete products selected or developed for implementing the PSI program outlined above, and the rationale for the various developmental decisions.

1. Placement/Assessment Instrumentation

An achievement test for use in student placement and assessment and a self-concept scale for use in student assessment were selected. Following is a description of the selected instruments, a brief discussion of the intended use of the instruments, and the rationale for the selection of the specific instruments.

a. Achievement Test Selection

As initially conceived, achievement testing of all students was required (1) to ensure that students had the knowledge necessary for entry into the PSI program, (2) to place each student at the appropriate point within the program, and (3) to provide a measure of achievement gains resulting from participation in the program. These requirements could be met by administering one or more tests. Meeting the first requirement, that of ensuring that students had the knowledge necessary for entry into the PSI program, appeared to be a relatively simple task. A brief reading comprehension test and a few simple addition problems would have sufficed.

Meeting the second requirement, that of placing each student at the appropriate point within the program, presented much more of a problem. What appeared to be required was a criterion-referenced test for determining which, if any, of the program objectives a student could already meet, thus exempting the student from the lessons intended to teach those objectives. Two possible approaches to criterion-referenced testing appeared possible. First, a single test (or two tests, one in language and one in mathematics) could be administered to determine initially where a student should be placed in the program. The primary advantage of such an approach was the one-time testing. The primary disadvantages were that no such test was available for any of the instructional packages under consideration, the excessive length of the test if the test was to have sufficient precision to provide reasonable assurance of accurate student placement, and the possibly demotivating effect on students of being tested on at least some materials which they had had no opportunity to master. An alternative approach would have been a brief criterion-referenced test at the beginning of each unit of instruction. One of the instructional packages under consideration already included such pretests (however, as discussed in the next section, plans had been made to use those pretests as practice posttests). Other than the fact that the pretests would have had to be developed, another major objection to such an approach was the extraordinary amount of paperwork likely to be required for more advanced students. For example, if the appropriate entry point of a student was at Lesson 25 of a 30-lesson series, the initial activity for the student would be the taking of 25 criterion-referenced tests.

Another consideration in using criterion-referenced tests for placement purposes is the appropriateness of the program objectives and the relationship between the instructional materials and these program objectives. For example, if the goal of an instructional program is to increase the reading level of students from the fourth grade level to the eighth grade level, what should the objectives be for each of the program lessons? How essential is any one of those objectives? The answer likely is that, as a practical matter, any number of objectives could be equally effective in meeting the program goal. In addition, the conditions (i.e., what the student is given, or not given, to assist in meeting the objectives) and standards (i.e., the degree to which the objectives must be met) set for the objectives, and the instructional approach taken to meet the objectives likely are as critical as the nature of the action required to demonstrate that the objectives have been met. For example, one objective of a language lesson might be that a student be able to spell correctly 100 specified words. One instructional approach might be that the student study one of the specified words and then immediately be tested to see if he/she can spell that word. If so, the student would proceed to the next word. Another approach might be that the 100 words are studied and that the student be tested one year later to see if he/she can correctly spell all of the words. There is a vast degree of difference between the two approaches. For the latter approach, a certain amount of "overlearning" of individual words is required. A student must learn a specific word so well that he/she is not confused when another similar word is learned. Also, the student must learn the words so well that one year of intervening activities does not distract him/her from correctly spelling the words. Also, the instructional approach taken to meet a specific objective may involve activities that result in the student's ability to meet other unintended or unspecified objectives.

One conclusion that can be drawn from the above considerations is that even if a student is able to meet a specific learning objective, without studying the instruction intended to teach the objective, the instructional materials may be helpful in reinforcing what already is known and in assisting the student in meeting other unintended or unspecified (but nevertheless desirable) objectives. For this reason, and because of the disadvantages listed above of using criterion-referenced placement tests, a decision was made not to use a test for placement purposes but, rather, to have all students start at the beginning of the PSI program. Such an approach was expected to provide the positive benefits of (1) providing an excellent review for more advanced students, (2) providing positive reinforcement from the successes enjoyed in easily completing the early lessons, and (3) assuring that students who would be serving as proctors had a thorough knowledge of the content of the units on which they would be providing assistance.

The final requirement for an achievement test, as noted above, was to provide a measure of achievement gains resulting from participation in the PSI program. Initially, the idea had been to use the number of units mastered for such a measure. The criterion-referenced tests used to determine mastery of each instructional unit (see subsection 4) would provide a measure of achievement gains if one could assume that mastery of the objectives was a result of participation in the instructional program. However, as discussed above, a decision had been made to provide all students with all of the instruction regardless of whether or not they already could meet certain of the instructional objectives. Therefore, using the number of units mastered as the major measure of achievement gains had some obvious disadvantages, and additional testing appeared to be required.

Another consideration was the desire to compare gains in the PSI classes with gains in two non-PSI classes. While the goals of the comparison classes were identical to those of the PSI classes, and the instructional objectives could be assumed to be closely related, no formal list of objectives was available for the comparison classes. Even if objectives had been available, there was a reasonable certainty that these objectives would differ somewhat from those of the PSI classes and, thus, minimize the usefulness of comparisons of any criterion-referenced test data.

Based upon the above considerations, a decision was made to select a standardized norm-referenced test for pre- and post-treatment administration to the PSI classes and comparison classes. By establishing a cut-off score, this test also would satisfy the requirement for a means of ensuring that students had the prerequisite knowledge for entry into the PSI program. Thus, the single test alone could be used to meet several of the program requirements.

While a number of reasonably appropriate achievement tests were considered, the Adult Basic Learning Examination (ABLE) was chosen, partly because it was the test currently utilized by the ABE staff at the cooperating institution but primarily because of its wide use with students from the target population. The ABLE (Harcourt, Brace, Jovanovich, Inc.) is a battery of tests designed to measure the level of educational achievement among adults. ABLE was developed to fill the need for an instrument to determine the general educational level of adults who have not completed formal eighth-grade education, as well as for use in evaluating a number of efforts to raise the educational level of these adults. The examination was developed in consultation with a variety of people working with the many facets of adult education and was designed to provide the following:

- Content which is adult oriented.

- Measurement of achievement as low as first grade.

- Format which does not appear childish and is easy to follow.

- Coverage of only the fundamental areas; efficiency in use of time.

- Simplicity of administration for teachers with relatively limited experience in testing.

In order to cover as much as eight years of school achievement, development of two batteries was necessary: Level I (Grades 1-4); and Level II (Grades 5-8). At each level, ABLE includes vocabulary, reading, spelling, and arithmetic tests.

The grade designation of the two levels refers to the achievement levels which the tests cover most reliably. At each level, there are two forms available, Form A and Form B, which are comparable in content and difficulty. The two forms are for use when reevaluation or periodic testing is desired.

All tests are essentially without time limits. On non-dictated tests, the examiner is directed to allow all students ample time to attempt all questions which they are capable of answering correctly. Thus, the ABLE is in all respects a power test.

Level I of the battery appeared to be more appropriate than Level II for use as a placement device. While either level could be used to estimate whether or not a student functioned at the fourth grade level (the entry level for the PSI program) in language and mathematics, the Level I likely would have required slightly less administration time and, since it is an easier test, likely would have been less demotivating to the students. However, the Level I is not particularly reliable at the fifth and sixth grade levels and does not cover the seventh and eighth grade levels at all. Therefore, since the test was to be used primarily as a pre- and post-treatment assessment instrument for students supposedly functioning at the fourth to eighth grade levels, the Level II was selected.

Because of the length of time required to complete the battery (approximately 135 mintues), and because the vocabulary and spelling tests must be dictated (thus complicating administration to students who enrolled after the initial meeting), those tests were not intended to be used. The items in the remaining tests (in reading, computation, and problem solving) were reviewed and found to bear a reasonable relationship to the PSI objectives and instructional materials and, thus, were selected as the achievement test for use in the program.

b. Self-Concept Scale Selection

After considering a number of self-concept scales, the Tennessee Self-Concept Scale was selected for use.[2] The primary reasons for this selection were that the scale appeared more suitable for use by adults than did the other reviewed scales and the scale was almost unanimously recommended by the ongoing ABE programs contacted by the researchers.

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[2] The Tennessee Self-Concept Scale is published by Counselor Recordings and Tests, Box 6184, Acklen Station, Nashville, Tennessee 37212.

The Tennessee Self-Concept Scale consists of 100 self-descriptive statements which the subjects use to portray their own pictures of themselves. The Scale is self-administering for either individuals or groups having at least a sixth grade reading level and can be used with subjects age 12 or higher. It also is applicable to the whole range of psychological adjustment from healthy, well-adjusted people to psychotic patients. Scoring can be accomplished either by hand, or by machine through the test publisher. Most subjects complete the Scale in 10 to 20 minutes (mean time about 13 minutes). Hand scoring requires about 6 or 7 minutes.

While a number of scores may be obtained from the scale the two most important scores are the Self Criticism Score and the Total P Score. The Self Criticism Score is composed of 10 items. These are all mildly derogatory statements that most people admit as being true for them. Individuals who deny most of these statements most often are being defensive and making a deliberate effort to present a favorable picture of themselves. High scores generally indicate a normal, healthy openness and capacity for self-criticism. Extremely high scores (above the 99th percentile) indicate that the individual may be lacking in defenses and may in fact be pathologically undefended. Low scores indicate defensiveness, and suggest that the Positive Scores are probably artificially elevated by this defensiveness. The Total P Score is the most important single score. It reflects the overall level of self esteem. Persons with high scores tend to like themselves, feel that they are persons of value and worth, have confidence in themselves, and act accordingly. People with low scores are doubtful about their own worth; see themselves as undesirable; often feel anxious, depressed, and unhappy; and have little faith or confidence in themselves. If the Self Criticism Score is low, high P Scores become suspect and are probably the result of defensive distortion. Extremely high scores (generally above the 99th percentile) are deviant and are usually found only in such disturbed people as paranoid schizophrenics who as a group show many extreme scores, both high and low.

Since the contacted users of the scale indicated that ABE students generally had some difficulty reading the items on the scale, a decision was made to have the classroom manager read the items to the students. Also, since time in class already was at a premium and since changes in self-concept are less likely to occur over short time periods, a decision was made to administer the scale only at the beginning and end of the six month implementation period. This decision meant, of course, that new students entering the program after the first few weeks of implementation would not be tested.

Steps were taken to overcome several anticipated difficulties with administering the scale. First the test administrators were to be cautioned that students could become confused regarding the person referred to in the items in the scale. Since the items are written using the first person and the classroom manager would be reading the items, the students needed to be cautioned that an item such as "I am neither too fat nor too thin" referred to the student and not to the classroom manager who was reading the items. Also, both the answer sheets and scale manuals were revised to simplify the numbering of the items. The first five items in the published scale, for example, are Items 1, 3, 5, 19, and 21, in that sequence. Item 1 is the first item on the third row of the answer sheet, Item 3 is the third item on the third row, Item 19 is the seventh item in the third row. While this arrangement simplifies hand scoring, it greatly complicates the administration of the scale. To simplify administration, the items in the scale manuals were renumbered from 1 to 100 and new matching answer sheets were prepared (see Appendix A). The necessary translations then were prepared to permit hand scoring of the reordered scale.

2. Student Introduction to PSI

A self-instructional unit was prepared to introduce the students to PSI. This unit was intended to be motivational, in that it would provide the students with an early example of mastery learning; and instructional, in that it would provide the students with simple guidelines for moving through the instructional program. The general format of the unit was patterned after the format of the language and mathematics units. A copy of the unit is included as Appendix B.

3. Instructional Materials

Since the cooperating institution's current ABE program was not self-paced or self-instructional, one of the major developmental activities was the selection/adaptation/development of instructional materials. One of the major early considerations had to do with the scope of the proposed PSI program. Because of limited time and resources, providing PSI instruction in only one basic skills area (e.g., mathematics) was given serious consideration. However, because of the interrelationships between the various basic skill areas, the cooperating institution's responsibility to provide instruction in both language and mathematics, and the practical problems involved in attempting to organize a group of students to use PSI part of the time and a conventional classroom approach the remainder of the time, a decision was made that the PSI program must provide both language and mathematics instruction.

A preliminary review of commercially available basic education materials emphasized the large quantity and diverse characteristics of such materials. The limited research resources clearly precluded a review of more than a small proportion of potentially suitable materials. The review, thus, was limited to materials suggested by the several contacted current research program personnel, materials recommended by local providers of ABE instruction, and materials available in local libraries and resource centers. The reviewed materials were evaluated based on the extent to which the materials:

- Were suitable for students whose achievement levels were between the fourth and eighth grade levels.
- Were suitable for use by adults.
- Were self-instructional in nature.
- Were sufficiently comprehensive to serve as at least the major source of information in the subject area covered.

- Provided a reasonable balance between drill and practical application.
- Were packaged in lessons of reasonable length (i.e., lessons that would require the typical student from one-six hours to complete).
- Included appropriate instructional objectives.
- Included mastery tests.
- Were readily available and priced within the research budget.

A portion of the Steck-Vaughn Adult Reading Program[3] was selected as the basis for the language instruction, based on its meeting most of the above-listed requirements and on the fact that many of the cooperating institution's ABE teachers already used the program. A portion of the Individualized Mathematics Program[4] was selected for the mathematics instruction, based on its meeting all of the above objectives. Following is a general description of revisions and additions that were made and of the resultant language materials and mathematics materials.

However, before providing details of the developmental procedure and products, a brief discussion of some of the developmental guidelines appears to be in order. These guidelines relate to the distribution strategy planned for the instructional materials and the degree to which the instructional packages include instructions for their use.

Regarding distribution strategies, developmental guidelines were based on a choice made between two general material distribution approaches. One possible approach would have been to provide the instruction in one package and a workbook for actual use in answering questions or solving problems in another package or series of packages. Another approach would have been to provide a series of packages, each of which included integrated instruction and related workbook problems.

With the first approach, each instructional materials package could have included large portions of, or even all of, the instructional materials for a particular instructional program. The students may have been intended to use the package as an information source and intended to carry out any related activities, such as answering questions or solving problems, in a separate workbook package or on note paper. The instructional package then would be returned to the classroom manager who would issue it to a new student. This approach has several advantages and several disadvantages. The approach is efficient in that the quantity of required materials is reduced. Since the materials may be used by a number of students over time, the number of required copies is held to a minimum. Also, the distribution of materials is simplified; since fewer packages are required, less effort is needed to ensure that each student has the appropriate materials. The major disadvantages of such an approach are that students must master several unintended objectives in order to meet the intended one. Learning to transfer problems from the instructional package to a worksheet, or learning to relate responses in one package to instruction in another package are several such unintended objectives. The strong possibility exists that meeting such objectives can distract from meeting the intended objectives, and that the cost in learners' time and energy will be quite high when compared to the rather doubtful value of meeting such unintended objectives. Another disadvantage is that, even though asked not to do so, students often mark in such instructional packages. For example, students often circle correct answers, work mathematics problems, or write down correct responses to questions in the instructional package. This severely limits the value of the material as a self-instructional package for subsequent users.

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[3] Steck-Vaughn Company Publishers, P.O. Box 2028, Austin, Texas 78768.

[4] EdITS Publishers, P.O. Box 7234, San Diego, California 92107.

The alternate approach would be to provide each student with a small package of materials which would become the property of the student and not only would provide the instruction but also would serve as a workbook for answering questions and solving problems. Such an approach has several advantages and disadvantages. A number of advantages are apparent. The student is provided with only the materials with which he/she is working. This can be motivational in that there is an end in sight: when the student completes this lesson, he/she moves on to something new. Also, since the materials belong to the student, the materials are available if required for reference or review. The instructional package also is a workbook that includes the student's responses; thus, areas in which the student is weak are readily available for review. The disadvantages of such an approach are that a relatively large quantity of materials are required and that the proper distribution of these materials can be burdensome.

Developmental guidelines also were based on decisions regarding the degree to which the instructional packages would serve to include directions for their use. One of two related approaches generally is taken with PSI programs. The simplest approach from a developmental point of view generally is to provide the instructional materials in whatever format they are readily available and to prepare a separate package of directions on how the student is to use the materials. The alternate approach is to include instructions for use of the materials as integral parts of the instructional package.

An early decision was made to prepare the instruction in small, self-contained packages, each of which would serve as a workbook and would provide all required instruction for using the materials. What was intended was that when a student was provided with a unit of instruction, he/she would be able to turn to the first page which would, in effect, say: "Now you have this lesson in your hands. First, read the instructions on this page. Then turn to the next page, work the problems listed there, and then follow the instructions that are provided there so that you will know what to do next." The appropriate instructional package was to be provided to each student whenever the student mastered the preceding unit. The package would belong to the student, who was free to study the included materials in class or at home, and free to keep the materials for future reference or review. Fortunately, the selected mathematics materials and, to a lesser extent, the selected language materials, were conducive to fairly simple revisions to meet these developmental guidelines.

a. The Language Instructional Materials

The Steck-Vaughn Adult Reading Program selected as the basis for the language portion of the PSI program was designed specifically for use by adults. The total series is a sequential instruction program of essential reading skills designed to move the mature learner from non-reading to reading maturity. The program builds a basic vocabulary of words necessary for coping in life situations, teaches the phonics and structural analysis skills needed to unlock thousands of other words, and heavily emphasizes literal, inferential, and critical comprehension skills. Content selection deals with the general areas of occupational knowledge, consumer economics, government and law, health, interpersonal relationships, and community resources. The materials are divided into two sets of books with grades 0-4 reading level in the first set and grades 4-8 reading level in the second set. The first set contains seven books (Reading 1100-1700) emphasizing prereading skills, sight words, phonics, structural analysis, and comprehension. Optional audio cassettes are required for independent study. The second set consists of eight books (Reading 2100-2800) and emphasizes comprehension skills, specialized reading skills, and personal reading skills. This set, since it was designed for use at the targeted grades 4-8 reading level, was utilized in the PSI program.

To follow the developmental guidelines discussed above, considerable work was required to repackage the five books to be used. Following is a discussion of the revision activities.

Each of the five books in the original program contained five distinct lessons. The first activity was to package each of these lessons separately. This gave a total of five modules of five units (or lessons) each for a total of 25 unit packages. A sample of a completely revised unit is presented as Appendix C.

The pretest at the beginning of each of the original program lessons was deleted. This was done for several reasons. First, a decision already had been made (see subsection 1 above) not to use a criterion-referenced pretest. Second, since three posttests were desired (see subsection 4 below) any suitable pretests would have been reserved for use as posttests. Third, many of the pretests were considered unsuitable for use in that they did not appear to test the appropriate skills.

Since a practice mastery demonstration (posttest) was to be included with each of the new units (e.g., see the last four pages of Appendix C), the pretests from the original program, where such tests were considered suitable for use, were organized into a format identical to that of the actual mastery demonstration instruments (see subsection 4) and appended to each of the new instructional units for use by the students as a practice posttest. Those pretests that were considered unsuitable for use were discarded and new practice mastery demonstration instruments developed. An example of a pretest considered unsuitable for use is included as Appendix D. The objective of the unit for which the example test was intended to serve as the pretest was: the learner recognizes that an affix can modify the meaning of a base word and/or help identify the grammatical function of the base word. The researchers concluded that the example test does not address that objective.

Correct responses to the items in each instructional unit of the original program were provided on other pages of the lesson book. By folding the proper page, these responses could be observed along with the related items. This format was revised to include the correct responses in the identical location on each page following the page containing the items requiring a response. This was expected to make it easier for the students to locate the responses.

Instructions were added to tell the students exactly how to proceed through each unit. Considerable instructions were provided in early units and the amount of instruction decreased in later units. Since the unit presented in Appendix C was the first unit of the language series, it contains the maximum amount of instruction.

A new front cover was designed.

The Steck-Vaughn Company granted permission for the researchers to reproduce a limited number of the repackaged units for use in the research discussed in this report.

Another substantial addition which was made to the language instruction was the addition of five units made up solely of selected readings. These units (the sixth unit of each of the five modules) were intended to provide additional practice in reading comprehension of stories, poems, and articles. Materials for these units were provided by Scott, Foresman from their soon-to-be-released adult reading comprehension series.[5] The selected materials were from Scott, Foresman's Books A through D (reading level from grade 3.0 to 5.9). The format of these units was made compatible with the 25 Steck-Vaughn units. Included practice mastery demonstration instruments were developed from some items provided by Scott, Foresman and new items developed by the researchers.

The resultant reading comprehension instructional materials consisted of five modules of six units each. The module and unit titles are as follows.

Module I: Word Meaning Analysis Skills

- Unit 1: Prefixes
- Unit 2: Suffixes
- Unit 3: Synonyms and Antonyms
- Unit 4: Homophones
- Unit 5: Words with Multiple Meanings
- Unit 6: Selected Readings

Module II: Analysis and Synthesis Skills

- Unit 1: Context Clues
- Unit 2: Hidden Context Clues
- Unit 3: Organization Clues
- Unit 4: Analysis of Sentences
- Unit 5: Synthesis of Sentence Content
- Unit 6: Selected Readings

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[5] Scott, Foresman Lifelong Learning Division, 1900 East Lake Avenue, Glenview, Illinois 60025.

Module III: Main Idea Analysis Skills

- Unit 1: Stated Organizer and Stated Details
- Unit 2: No Stated Organizer But Stated Details
- Unit 3: Stated Organizer But Hidden Details
- Unit 4: No Stated Organizer and Hidden Details
- Unit 5: Hidden Organizer and Hidden Details
- Unit 6: Selected Readings

Module IV: Conclusion Analysis Skills

- Unit 1: Logical Outcomes
- Unit 2: Stated Conclusions
- Unit 3: Cause and Effect Relationships
- Unit 4: Conclusions Based on Direct Relationships
- Unit 5: Conclusions Based on Indirect Relationships
- Unit 6: Selected Readings

Module V: Sequence Analysis Skills

- Unit 1: Events Before or After
- Unit 2: Calendar Markers
- Unit 3: Explicit Cues
- Unit 4: Implicit Cues
- Unit 5: Implied and Stated Events
- Unit 6: Selected Readings

b. The Mathematics Instructional Materials

The Individualized Mathematics Program selected for the mathematics instruction is published in five levels: the Level K kit for kindergarten through grade 2; Level A for grades 3 and 4; Level B for grades 4 through 6; Level C for grades 7 through 9; and Level D for grades 10 through 13. The Level C and D kits, however, address many of the same objectives as do the Level A and B kits. For example, Levels C and D both begin with simple addition and other basic computational problems. The materials are designed for children of the ages typically found in the above indicated grade levels. Level D, then, is more suitable for adults. Since Level D addressed most of the critical basic skills, but in a manner more suitable for an adult audience, it was chosen for use in the PSI program. Only minor "cut and paste" changes were made to instructional packages. These changes were as follows.

The materials were arranged in five modules of five units each. New covers carrying the new lesson designations were attached.

Instructions for use, basically similar to the instructions for the language units, were inserted.

The pretests originally included with each lesson were removed and combined as new review units. In general, these review units also included selected sections of practical application instruction from other units which were not used in their entirety.

The module and unit titles for the resultant instructional packages were as follows.

Module I: Computation Skills

- Unit 1: Addition
- Unit 2: Subtraction
- Unit 3: Multiplication
- Unit 4: Division
- Unit 5: Review and Marketing/Prices

Module II: Fraction Manipulation Skills

- Unit 1: Addition
- Unit 2: Subtraction
- Unit 3: Multiplication
- Unit 4: Division
- Unit 5: Review and Probability Calculations

Module III: Decimal Manipulation Skills

- Unit 1: Addition and Subtraction
- Unit 2: Multiplication
- Unit 3: Division
- Unit 4: Adding Fractions to Decimals
- Unit 5: Review and Bank Balances

Module IV: Percent Manipulation Skills

- Unit 1: Percent
- Unit 2: Percent: Advanced
- Unit 3: Percent Applied to Budget
- Unit 4: Review and Interest
- Unit 5: Wages and Earnings

Module V: Advanced Calculation Skills

- Unit 1: Integers
- Unit 2: Multiplication and Division of Integers
- Unit 3: Probability
- Unit 4: Averages
- Unit 5: Discounts and Advanced Calculations

4. Mastery Demonstration Instruments

The mastery demonstration instruments were intended to be as brief as practical but to provide sufficient examples of the students' knowledge to ensure mastery of the objectives of each unit. As was discussed earlier, at least two mastery demonstration instruments were required for each PSI unit. One instrument was included with the PSI instructional package and was intended for use by the student as a practice mastery demonstration. Since the correct responses to this practice instrument also were included with the instructional package (see subsection 3 and the last four pages of Appendix C), the student was provided with immediate feedback regarding any areas that he/she had not yet mastered. Once a student demonstrated mastery with the practice instrument, the assumption was that he/she would have no difficulty demonstrating mastery with the quite similar mastery demonstration instrument administered by a proctor.

The procedure for developing the mastery demonstration instruments to be administered by a proctor was basically the same as that for developing the practice instruments. That is, many of the Steck-Vaughn materials already included an acceptable posttest. This posttest was used as the mastery demonstration instrument. Where suitable tests were not provided, such tests were developed. As with the practice demonstration instruments, mastery instruments were developed for the Scott, Foresman materials using some Scott, Foresman test items and adding newly developed items. Because of the effort involved in developing new tests, only one form of the mastery instrument (in addition to the practice demonstration form) was prepared for the language units. An example of a mastery instrument is included as Appendix E. The answer sheet is presented as Appendix F.

The Individualized Mathematics Program kit included a Form A and Form B posttest for each mathematics unit. These were in addition to the practice test already included in each unit. Thus, the Form A and Form B posttests were used, as provided, for the mastery demonstration instruments for the mathematics units.

5. Classroom Manager Instructions

No formal classroom instructions were prepared since a formal training session was planned. However, an outline of some of the major points to be covered in the training, particularly points which the classroom managers would need to review later, was documented. This outline is presented as Appendix G.

Additional materials were developed for use by the classroom managers in managing the classes and in obtaining required data. These materials are discussed in Chapter 4.

6. Proctor Instructions

A decision was made to use internal proctors (that is, individuals who also were students in the class) rather than external proctors (that is, individual from outside of the PSI class whose relationship to the program was limited to that of proctor). There were two major reasons for this decision. First, the introduction of outside proctors into the classroom could have been perceived as threatening to the teachers who in many ways met the requirements for a peer proctor. All of the teachers were from basically the same socioeconomic background as the students and most of the teachers had had minimal training in teacing basic education. Also, their race and age were similar to most of their students.

Another reason for choosing internal proctors instead of external proctors was that the planned role for the proctors was primarily that of administering mastery demonstration instruments. Since the instructional materials were planned to be self-instructional, the "teaching" role of the proctor was expected to be minimized. Internal proctors typically have proven quite satisfactory in filling the planned role.

Since no formal training for proctors was planned (since any student in the PSI program might be a proctor at one time or another), a booklet was prepared to outline for the proctors their responsibilities and how they should fulfill them. Copies of this booklet were intended to be made available for review by any student who was qualified to be a proctor. A copy of the booklet is included as Appendix H.

7. Motivational Activities

As was noted earlier, to fulfill the "motivational lecture" requirement of PSI, the presentation of motivational films was planned. These presentations were to be followed by group discussions led primarily by the classroom manager. These activities were expected to be useful in several ways. First, the entertainment nature of the selected films was expected to provide the students with an opportunity for a somewhat different relationship with each other and with the classroom manager. Second, the activity would provide the researchers with an opportunity to observe the class reactions to a more relaxed atmosphere. Third, the motivational nature of the film and the group discussion was expected to provide an opportunity for students to discuss any academic difficulties they were having and how these difficulties might be overcome.

A minimum of two films was planned. Two selected films were: (a) "Climb" (22 minutes, color), Churchill Films, 662 North Robertson Blvd., Los Angeles, California 90069; and (b) "It Couldn't Be Done" (53 minutes, color), Films, Inc., 1144 Wilmette, Wilmette, Illinois 60091.

Chapter 4

The Research Design

As was noted in Chapter 1, the primary objective of the study herein described was to answer the question: "Is further investigation of the use of PSI for nontraditional adult learners likely to be worthwhile?" A secondary objective was to identify potentially fruitful areas for further investigation. To address these objectives, what essentially was a case study approach was planned for each of three selected implementation sites. While collection of some comparison data was planned, the primary emphasis was intended to be upon collection of observational information at the three sites.

No rigid rules were established for the collection of on-site observational information. Instead the intent was to prepare a list of critical events based on observation rather than tailor the observations to fit a predetermined list of anticipated events. This idea of observing and interviewing with a minimum of predetermined assumptions was adapted from a report of previous ABE research by Mezirow, Darkenwald, and Knox (1975). However, as with the referenced research, an orienting framework was established to form a basis for initial inquiry.

This orienting framework for observational data collection was, in general, based upon the following:

Student reactions to:

other students
proctors
teacher
the instructional system
the instructional materials

Proctor reactions to:

students
other proctors
the instructional system
the instructional materials

Teacher reactions to:

students
proctors
the instructional system
the instructional materials

More specifically, the orienting framework included observations of:

- Students' initial reactions to:
    - Test taking.
    - Requirements for mastery learning.
    - Self-paced learning.
    - Self-instructional materials.
    - Being proctored by peers.
    - Proctoring of peers.
    - Modified teacher role.
- Nature of changes in students' reactions to all of the above subitems.
- Evidences of, and possible causes of, changes in students' reactions.

- Evidences of academic achievement.
- Evidences of change in self-concept.
- Evidence of interest in either specific or general program activities.
- Evidences of change in self-dependence.
- Evidences of change in self-assertiveness.
- Evidences of increase in life coping skills.
- Nature of group interactions.
- Evidences of group cohesiveness or division.
- Nature of student-proctor relationships.
- Techniques used by proctors.

  Effective techniques.
  Ineffective techniques.
- Factors affecting the proctor role.
- Nature of proctor-teacher relationships.
- Teacher role.

Several record forms were provided to the classroom managers for recording student activity and opinion information and for noting significant classroom observations. A student record form was provided for recording each student's activities (see Appendix I), charts were provided for recording the names of students who qualified as proctors for different units (see example in Appendix J), a form was provided for the classroom managers' use in recording students' comments regarding their opinions about each lesson and the assistance they received with each lesson (see Appendix K), and a loose-leaf notebook was provided for the classroom manager to record general observations and comments.

While classroom observations were intended to be made primarily by the classroom manager, observations also were intended to be made by the researchers. At-least-weekly visits were planned to each of the PSI classes. The resultant observational data were intended to be summarized by site, and pertinent factors (i.e., factors pertinent to the research questions) highlighted. Because of the largely unstructured nature of the observational data collection activity and the uncertainty as to the exact nature of the data, no specific plans for analysis or reporting were made.

In addition to collecting the observational data, plans were made to collect specific objective data that were considered to be measures of class and individual student progress. However, because of the very small number of classes and students, no generalizing of findings was intended. Four specific types of objective data were to be collected: number of units mastered; pre- and post-treatment self-concept measures; pre- and post-treatment achievement measures; and attendance records. Following is a brief discussion of each.

As was discussed in Chapter 3, a decision was made to have all students start at the beginning of the PSI program and study the units in a predetermined order regardless of whether or not they already could master some of the units. To assist in estimating whether or not a student mastered a particular unit based on what he/she learned from studying a unit (as opposed to mastering the unit based on prior knowledge), each student was to be asked, as a part of the mastery demonstration exercise, whether or not he/she could have demonstrated mastery if he/she had not studied the unit. If the student indicated that he/she could not have demonstrated mastery without studying the unit, an assumption was to be made that mastery of the unit was one measure of program success.

As was noted in Chapter 3, portions of the ABLE achievement test were to be administered to all incoming students in the three PSI classes and in two "conventional" classes. The alternate form of the test was to be administered as a posttest at the end of the planned six-month implementation period. Several difficulties were anticipated in using these achievement data as measures of program success. First, the number of classes and students was quite small, the total treatment consisted of a maximum of 88 hours in class (and, thus, was not likely to produce significant gains), and many of the students supposedly had an aversion to test taking. Second, because of an expected high turnover rate of students, very few if any, students who took the pretest were expected still to be enrolled for posttesting. Even if only a few students took both the pre- and posttests, comparison of intact classroom measures was expected to provide some indication of gain.

Also, as noted in Chapter 3, the Tennessee Self-Concept Scale was to be administered as a pre- and post-treatment measure of changes in self-concept. All of the limitations discussed above for the achievement testing also were expected to apply to the self-concept measuring. Two additional factors even further lessened the chances of using the resultant data for estimating program success. First, the self-concept of a group of students is even less susceptible to short-term change than is academic achievement; therefore, only minimal change in self-concept scores was expected. Second, since the initial administration of the scale would take place only one time (late enrollments would not be tested), the number of students with both pre- and post-treatment self-concept measures was expected to be even smaller than for achievement testing.

A fourth type of objective data, student attendance, was expected to provide some measure of program success in maintainining student interest.

One particularly important researcher opinion or bias was reflected not only in the selection of the implementation setting, but also in how the research was intended to be conducted. Some discussion of this bias appears to be in order at this point. One approach to exploring the potential effectiveness of an instructional program would have been to select a near-perfect setting, well-trained, dedicated personnel who were completely devoted to the proposed research, and highly motivated, cooperative students. The researchers then would supervise the proposed activities to ensure an optimum implementation environment. Such an approach would practically guarantee that the program would be a success, and also practically guarantee that when the typical practitioner attempted to implement the same program in a real-world setting, he/she would not achieve the same results.

Another approach would have been to conduct the research in a real-world setting; that is, to have deliberately chosen a setting where problems with available resources, staff cooperation, and student participation were expected to occur. Then the program to be implemented would be introduced in this imperfect setting and permitted to run its normal course without researcher intervention. The reader is reminded that the objective of the research reported herein was not to examine the various elements of PSI in an attempt to determine the relative contribution of each; it was not to determine the success of PSI as compared to some other approach; it was not to control certain variables while systematically manipulating others in an attempt to increase the effectiveness of PSI. While carefully controlled research well might have been justified to address such issues, such controlled conditions easily could have been self-defeating when attempting to meet the current research objectives. Since the primary current objective was to obtain information for making recommendations regarding the direction of any indicated further research, and since institutional, teacher-related, or organizational problem areas well might have proven to be some of the major factors requiring further investigation, the latter approach indicated above appeared most appropriate.

There are, however, some risks involved in conducting research in a relatively uncontrolled environment. The adversities faced by the program may be so extreme that the only meaningful data that can be collected is information regarding factors that contributed to failure of the program. To guard against such a possibility, the researchers selected three sites (all a part of the cooperating institution's program) for implementation rather than concentrating on a single site. This had the disadvantage of limiting the degree of observation possible at any one setting, but the advantage of increasing the chances that at least one setting would be sufficiently stable to provide useful data regarding program effectiveness.

The above discussed observational information along with the noted objective data were expected to be adequate for ascertaining whether or not further related research on PSI with nontraditional adult students is likely to be worthwhile, for suggesting possible cause and effect relationships, and for identifying potential areas for, and guidelines for, further research. The above noted observation-without-intervention approach also appeared to hold promise for providing some additional insights into how an ABE program works; that is, for supporting or refuting the somewhat grim picture of ABE painted by other researchers (e.g., Mezirow, Darkenwald, and Knox, 1975).

Chapter 5

The Actual Program Setting

As was noted in Chapter 2, certain specific characteristics of the proposed program setting were critical to the development and planned implementation of the PSI program. While reasonable care was exercised to verify assumptions regarding these critical program setting characteristics, the actual program setting was found to differ from the proposed program setting in several important aspects. This chapter discusses these differences and notes possible or probable reasons for the differences.

The first major change from the intended program setting characteristics occurred during the developmental activities described in Chapter 3. Certain internal difficulties at the cooperating institution and the loss of a considerable amount of its anticipated funding not only resulted in the discharge of the entire cooperating institution ABE administrative staff, but also minimized other expected support services such as test administration services.

Also, as a result of the above, teacher assignments were delayed. In fact, until several days prior to the first class sessions, there was considerable doubt as to whether the ABE program would operate at all. Because of this delay in teacher assignments, only negligible inputs could be obtained from the teachers prior to the beginning of program implementation as to their opinions regarding the adequacy of the PSI materials or program structure. Teacher training was limited to one thirty-minute session with one teacher.

The intended teacher of one of the PSI classes became ill the day prior to the beginning of classes and was replaced by a teacher who was new to the cooperating institution and who had no teaching experience with ABE students. Another teacher, the teacher responsible for the prison setting planned for inclusion as one of the three PSI classes, was expected to be familiarized with the PSI program immediately upon his return from an extended vacation. While he had no previous knowledge of the PSI program or of his expected participation, the researchers had been assured of his cooperation. The researchers, the new administrator of the ABE program, and the teacher of the prison class met upon the teacher's return from vacation to discuss his participation. The teacher was considerably disturbed at the idea of introducing PSI into the prison class, and was adamant in his insistence that a structured approach would be untenable. No reasons were given that appeared logical or reasonable to the researchers. Indications of fear of being observed, monitored, or subjected to reporting activities appeared to be the teacher's overriding concern. The researchers had no alternative but to drop the prison class and select an alternate setting. Another of the cooperating institution's housing project classes, this one a night class, was selected as the replacement.

As was noted in Chapter 2, each ABE class was expected to include 10-15 students functioning at between the fourth and eighth grade levels in reading comprehension and mathematics. Actual enrollment, as will be discussed in detail in Chapter 6, was considerably lower than expected. Also, as detailed in Chapter 6, the entry performance level of the students was considerably lower than expected, with 36 percent of the students scoring below the fourth grade level in reading comprehension, 44 percent scoring below the fourth grade level in mathematics computation, and 83 percent scoring below the fourth grade level in mathematics problem solving (see Table 5.1).

Since the teachers were paid only for contact hours with the students, they were only minimally available (on their own time and usually in their homes) for consultation with the researchers. Contact and communications between the teachers and the administrative staff also was found to be almost nonexistent, and communication between the administrative staff and the researchers was made difficult by the added work load assumed by the administrative staff. Expected support services, such as personnel to assist with test administration and selection of any required supplementary instructional materials, were only minimally available the first three months of the program implementation, and were not available at all during the remaining three months.

Many of the above noted differences between expectations and reality likely were a result of the reduced funding made available to the cooperating institution for operating the program. Other noted differences, such as the lower entry level skills of the students, likely resulted from lack of a structured testing program for ABE and the resultant reliance on estimates of student achievement. Some differences may have resulted from the new staff's perceptions (or misperceptions) of the role of research in education, and the new and differing judgments as to the relative importance of student achievement versus institutional and personal goals.

Table 5.1

PERCENTAGES OF STUDENTS SCORING AT VARIOUS GRADE LEVELS ON ABLE TESTS

	ABLE Test	Grade Level						Total Percent[a]
		Below 4.0	4.0-4.9	5.0-5.9	6.0-6.9	7.0-7.9	8.0 and Above	
PSI Classes	Reading Comprehension	32.0	11.0	11.0	11.0	14.0	21.0	100.0
	Mathematics Computation	39.0	32.0	14.0	11.0	4.0	0.0	100.0
	Mathematics Problem Solving	79.0	0.0	11.0	7.0	0.0	4.0	100.0
Comparison Classes	Reading Comprehension	50.0	12.5	0.0	12.5	12.5	12.5	100.0
	Mathematics Computation	63.0	12.0	25.0	0.0	0.0	0.0	100.0
	Mathematics Problem Solving	100.0	0.0	0.0	0.0	0.0	0.0	100.0
Total Classes	Reading Comprehension	36.0	11.0	8.0	11.0	15.0	19.0	100.0
	Mathematics Computation	44.0	28.0	17.0	8.0	3.0	0.0	100.0
	Mathematics Problem Solving	83.0	0.0	8.0	6.0	0.0	3.0	100.0

[a] Total number of pretested students was 36; 28 in PSI classes and 8 in comparison classes.

Chapter 6

The PSI Program as Implemented

This chapter provides details of the implementation of the PSI program in the three selected sites, and a summary of the characteristics of the two comparison classes. Each of the first three sections discusses the implementation in a different one of the PSI sites. The fourth section describes the comparison classes. In order to present as complete a picture as possible of what occurred in the PSI classes, a narrative approach has been used to provide a chronological account of significant observed events and activities. The discussion in this chapter, however, is restricted primarily to how the program was implemented. A detailed discussion of program results (e.g., units completed, test scores, attendance records) is reserved for Chapter 7.

As was noted in Chapter 4, the particular research setting was selected precisely because it was thought to be reasonably representative of ABE programs across the country. If no difficulties had been encountered in implementing the PSI program, the researchers would have been disappointed at being denied the opportunity to observe the program in a realistic setting. Fortunately, the researchers were not disappoined. A sufficiently wide range of problems was encountered to convince the researchers that PSI was given a difficult but reasonably fair trial.

Some context information likely will be helpful in gaining an understanding of the events that occurred during the program implementation. Considerable tension apparently existed between the former coordinator of the ABE program and the present coordinator. Many of the staff apparently felt forced to make decisions between personal loyalty and job security. When, due to higher level internal conflicts and reduced funding, ABE administrative changes were made, some staff members apparently found themselves in the awkward position of having been loyal to the losing team. This apparently resulted in considerable fear, suspicion, and insecurity. The change also was an abrupt one, rather than a smooth transition. The new ABE coordinator was forced to pick up the pieces of the program with little guidance or assistance. She also inherited a staff not of her own choosing. From this starting point, the PSI program implementation, as outlined below, took place.

Throughout the internal conflicts referred to or implied above, the researchers refused to choose sides, refused to become involved, and continued to maintain a friendly, open relationship with all of the involved personnel. The negative impacts on the PSI program, as included in the chronology of events outlined below, were in no way intended to inconvenience the researchers, but were, rather, logical outcomes of the stress within the cooperating institution. Such stresses are not thought to be atypical. The researchers sought, and succeeded in finding, a real-world setting for the PSI implementation.

A. Program Implementation in PSI Site A

This section provides a chronological account of significant events and activities that occurred in one of the PSI classes. For simplicity, this class hereinafter will be referred to as Site A. Site A was an on-campus class that initially met from 9:00 a.m. until 11:00 a.m. two days a week.

Classes were held in a regular classroom in one of the main central campus buildings. The summer quarter began on July 10, 1980 and ended on September 25 (a total of 22 class sessions).

Several days prior to the first classes (immediately following reasonable assurance that the cooperating institution would have funds to operate the program), a meeting was scheduled to describe the PSI program to the two available teachers (the third proposed teacher was on vacation). The two teachers arrived as scheduled for the training session; however, the teacher for the Site A class came only to report to the cooperating institution's administrative personnel that she had not fully recovered from a recent illness and thus would not be able to teach her assigned class. A new teacher was employed the following day and was introduced to the researchers immediately prior to the first class session. The teacher, a young, black male, had an undergraduate degree in business administration. He had previously attended the cooperating institution as a GED student. He had had no previous teacher training or teaching experience. During the few minutes available for describing the PSI program, the researchers provided a broad overview, provided the necessary materials (including the outline of teacher responsibilities shown in Appendix F), and encouraged the teacher to telephone the researchers regarding any needed clarification or additional instructions. Also, the teacher was encouraged to come to classes as early as possible so as to meet with the researchers before classes to exchange information regarding program plans, progress, and problems. (As was noted in Chapter 5, the ABE teachers also had other employment; they generally were not able to schedule any significant amounts of time for working with the researchers.)

The teacher showed considerable enthusiasm for the PSI program. He was particularly pleased that a structured program was available that would permit him to begin immediately with his classroom responsibilities. Since he was not familiar with teaching ABE students, the already planned PSI program relieved him of the responsibility for selecting materials, determining an instructional approach, etc. This was particularly important to him since he was not being paid for extra time to plan a program.

Student enrollment at Site A was expected to be at least 15. Actual initial enrollment was eight. An additional seven students enrolled at other times during the quarter. As was expected, the students were predominantly black (14 of the 15) and predominantly female (13 of the 15).

The first classroom activity (other than the registration process) was the administration of the Tennessee Self-Concept Scale and portions of the ABLE. Since, as noted previously, the cooperating institution's reduced funding had resulted in a reduction in personnel, the test administrator was available only part time. As a result, all testing in the PSI classes was done by the teachers. Some difficulties were encountered with both of the administered instruments. As was originally planned, the 100 items on the Tennessee Scale were read to the students. The students encountered three types of difficulty in responding to the items. First, the meaning and context of some of the words in the items (e.g., moral, morally, swearing, "all thumbs") were not completely clear to some students. Second, in spite of cautions, students still had difficulty with the first-person approach of the items as they were read by the teacher. For example, when the teacher read, "I am an attractive person," some students had difficulty remembering that the item referred to the student's attractiveness, not the teacher's attractiveness. Some difficulty was encountered with the numbering system used. The items were numbered 1-100 and the possible responses to each item were numbered 1-5 (see Appendix A). Some students tended to get one set of numbers confused with the other set. A better strategy probably would have been to use the letters a-e for the responses. The most serious difficulty was with the discriminations required by the scale and the difficulty of applying the discrimination choices to each of the 100 items. Many students struggled over decisions such as, for example, whether an item was "mostly false" or "partly false and partly true." If only two choices, "mostly false" and "mostly true" had been provided the administration would have been vastly simplified (however, test scores could not have been related to published norms). The students' scores on the scale ranged from about the fifth percentile to about the eightieth percentile. Five of the eight scored below the fiftieth percentile and three scored above (see Chapter 7 for additional data).

Form B of the reading comprehension, arithmetic computation, and arithmetic problem solving tests from the ABLE, and complete instructions for test administration, scoring, and interpretation of the scores were provided to the teacher. The teacher had noted in the Instructions for PSI Classroom Managers, Item 13 (see Appendix G) that students were to be allowed to take PSI instructional materials home with them and that they were allowed to obtain help with the materials outside of class. Unfortunately, the teacher interpreted this to apply to the ABLE test. As a result, the students took the tests home with them, obtained outside help in completing the tests, and returned the tests with almost 100 percent of the test items answered correctly. These tests were, of course, discarded. However, Form A of the tests was not yet available and the only way to get pre-treatment test data was to readminister the Form B. The extent to which the test scores were biased by this readministration within one week of the first administration is, of course, not known. However, there was high likelihood that the resultant scores were somewhat inflated. Of the eight students, two scored below the fourth grade level in reading comprehension, three below the fourth grade level in arithmetic computation, and six below the fourth grade level in arithmetic problem solving (see Chapter 7 for additional data).

Based upon the ABLE scores, six of the students began immediately on the PSI program. The two students who scored at below the third grade level in reading comprehension were provided with remedial instructions and intensive tutoring by the teacher until he considered their reading level to be sufficiently high to enter the program. These students, then, also entered the PSI program.

The initial PSI activity was for the students to study the unit entitled, "What is PSI?" (see Appendix B). The unit apparently was successful in providing the students with a general idea of the program organization. No particular questions, concerns, or positive comments were voiced. The researchers' general opinion was that the unit served the students reasonably well, but was of more value to the teacher since it described to the teacher, in a reasonably straightforward style, the concepts upon which the program was based.

As the quarter progressed, seven new students enrolled. Two of these were pretested and entered into the PSI program. The other five, because of their short period of enrollment and limited attendance, were not pretested and were not entered into the PSI program.

Only a few problems were encountered by the students with the early language and arithmetic units. During the first quarter, considerable progress was made in completing the units. The students appeared to be exceptionally enthusiastic. The peer proctor system worked well; the students seemed to like the idea of students helping students. The teacher was able to spend virtually full-time tutoring the few slow students. The teacher initially prepared reasonably detailed notes of his classroom observations. His enthusiasm was obvious. He emphasized that students were becoming more open, more willing to ask for and give assistance, and more anxious to fully utilize all of the class time. His primary negative comment was that some students appeared to have more difficulty with the reading comprehension than their ABLE test scores would have indicated. Also, he commented that several students had difficulty mastering the initial language or mathematics unit. These students apparently had not grasped the concept of mastery; that is, they had not accepted the idea that they really had to know the materials in one unit before they would be permitted to move on to the next unit. Once a student mastered the first unit, however, this problem largely ceased to exist for that student.

During most of the first quarter, the researchers' visits to the class tended to confirm the teacher's enthusiasm. The classroom was a beehive of activity. Competition was keen between several of the students to complete lessons first so that they could be the first to serve as proctor for that lesson. Many of the students obviously were doing a considerable amount of studying outside of class. Several students completed a module (five math units or six language units), and were presented with completion certificates (see Appendix L). This certificate proved to be an excellent motivator, and there was a noticeable increase in students' efforts to complete modules of materials so they would receive a certificate. The students also had indicated that they would like to spend more time in class. As a result, the cooperating institution agreed to extend the twice-weekly sessions to three hours beginning with the second quarter.[6]

Unfortunately, the optimistic results noted above began to moderate during the last weeks of the quarter. Several entries in the teacher's notes are indicative of the change. One entry notes that the teacher used the class session to "review materials already covered in PSI lessons." Another entry notes that "students are classroom oriented, and tend to lean more to the instructor-student relationship vs. proctor-student."

The time of the researchers' visits to the classroom was deliberately varied so as to increase the likelihood of observing the class as it was conducted when the researchers were not present. Several important changes began to be noticed. Often, when the researchers arrived, the students were not involved in individual activities but were passively observing a teacher lecture-demonstration. For example, a sizeable portion of one class session was devoted to a teacher lecture on primary colors, secondary colors, and the importance of knowing what happened if one mixed certain colors. No student participation (or interest) was observed. When the teacher was questioned about such activities, he attempted to assure the researchers that such incidences were exceptions to the rule, and that the PSI program was being implemented as planned most of the time.

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[6] While the sessions were extended to three hours during the second quarter, the result of the change was more latitude for the students in choosing whether to come early and leave early or come late and leave late. Typical attendance remained at two hours per session.

One of the decisions previously made by the researchers should be emphasized. While some researcher intervention, such as the unobtrusive visits to the class, was essential to collecting the required research information, such interventions were planned to be kept to an absolute minimum. The researchers could have, for example, worked through the cooperating institution's administrative staff in an attempt to force the teacher to strictly follow the PSI program guidelines. However, if this had been done, the researchers would have become a part of the treatment rather than simply observers of the treatment effect. For this reason, certain less-than-optimum conditions deliberately were permitted to continue.

Another indication that the instructor was deviating from the planned PSI program was noted when the researchers presented a "motivational lecture" in the form of a film (see Chapter 3) followed by a group discussion. This informal session, held near the end of the quarter, presented an opportunity for one of the researchers to be alone with the students. Some of the student comments related to their now having to do most of their PSI work at home since much of the class time now was taken up by other activities. Another student comment was, "The work is hard, but we can do it if they will just leave us alone." The close relationships between students also were noted. When one student had to leave early, she hugged three of the other women before leaving. Yet, according to the teacher, these women did not want to help each other but preferred to work with the teacher.

In spite of the above-noted distractions, results of the program at the end of the quarter were considered by the researchers to be excellent. The time between quarters also provided some additional time to talk with the teacher about conditions noted in the classroom and to emphasize that the teacher should not do anything (e.g., tutoring, administering mastery demonstration instruments) if there was a student available to do it. His response was that he would be firmer with the students and refuse to help them if help was available elsewhere. He added, however, that he was sure the students would be unhappy with such an approach.

The researcher's general impression of the teacher's motivation was as follows. When he first started with the class, he had little idea of how to teach an ABE class. He, therefore, was delighted that his role already was reasonably clearly defined. Since he had no particular alternative plans, he followed the plan that had been laid out for him. However, as he gained confidence in his position and as he made contact with other teachers, he recognized that his was not the typical approach to teaching adults. He seemed to assume that the "typical" way must be the "right" way. He seemed never to fully grasp that the PSI approach was more than a "set of instructional materials." He appeared to conclude that, as long as he used the researcher's materials, he was fulfilling any obligation he had to the researchers. So, since his perception of the "right" way to teach was for the teacher to teach and for students to listen and absorb his knowledge, he moved more and more in that direction.

Enrollment in Site A for the second quarter (October 2 through December 18) was 18. One-half of these were students continuing from the first quarter. Only two of the nine new students' reading levels were found to be sufficiently high to permit entry into the PSI program. (Three students were not tested because of quick drop-out or limited attendance. Two additional students were not tested, but the reason for this is not known.)

As the second quarter progressed, the class more and more became a conventional classroom with bored students sitting in neat rows while the teacher performed. On November 24, the teacher gave up all pretense of conducting a PSI class by stating that he was discontinuing the use of the PSI materials except for providing them as required for students to use outside of class. The teacher also documented this in a letter to the coordinator of the ABE program. He gave two basic reasons for the change. First, he stated that the PSI materials were too difficult for the students and that the materials could be mastered only after "regular classroom instruction, by way of blackboard use, and visual aids." The second, somewhat contradictory reason was that many of the students had learned so much that they should be taught the pre-GED test so that they could be transferred to the GED program. (The GED program apparently is funded separately from the ABE program with the cooperating institution receiving more funding for GED students.) The extent of institutional pressures to make these changes is not known to the researchers.

Since by this time only six more class sessions remained in the quarter, and since plans already had been made for three of these sessions (one session for another motivational film, and two sessions for posttesting), no action was taken by the researchers other than expressing their concern, to both the teacher and the ABE coordinator, regarding the seeming lack of logic in the reasons for the change and the apparent breaking of a commitment to the researchers.

The final "motivational lecture" near the end of the second quarter provided some additional insight into the classroom dynamics. Firm plans had been made with the teacher during a Tuesday class for the motivational film to be shown on the following Thursday. However, when the researchers arrived at the agreed-upon time on the agreed-upon day, the teacher had "forgotten" about the film and was busy testing the students to determine which ones were now eligible for the GED program. The researchers waited until the testing was completed, and then prepared to show the film. The once open communication between students appeared no longer to take place. The students appeared to be tense and to be passively agreeable to any suggestion from the teacher. The teacher's attitude appeared to be that he considered the film a waste of time, but that since he wished to score the tests anyway, he would leave and let us show the film.

The students appeared to thoroughly enjoy the film, and they actively participated in the discussion that followed. They exchanged ideas about the best ways to study self-instructional materials. For example, one student told how frustrated she became in attempting to work fraction problems. She noted that she would put the problem aside for an hour or so while she did some housework, and that she would then get back with the problem until she solved it. Several students commented that a PSI class would work just as well without a teacher. While the researchers recognized that the students' reactions could be attributed to any number of factors, they left the class with a strong feeling that what had once been an active, cooperative, effective classroom had been largely reduced to one where students felt thwarted and frustrated by the teacher's personal preferences and ambitions.

Obtaining posttest data for the class proved to be an only partially successful ordeal. The part-time person responsible for test administration had resigned at the end of the first quarter and was not replaced. After two months of intensive effort (continuing into the third quarter, which was not intended to be included in the PSI implementation), Tennessee Self-Concept Scale scores and ABLE posttest data were obtained for seven students. These data are discussed in Chapter 7.

B. Program Implementation in PSI Site B

Site B was a class held in a housing project recreation room from 6:00 p.m. to 8:00 p.m. twice weekly. This class was chosen for PSI implementation as a replacement for the originally-planned prison site. The teacher, a black female, had a teaching certificate and worked full-time in the Headstart program as a teacher. Her primary area of training and interest was in teaching grades K-3. She also had had several years' experience as a part-time ABE teacher.

The room in which the class met appeared no longer to be used as a recreation room. The building was in a poor state of repair. Most of the ceiling had collapsed as a result of a leaky roof, many of the windows were boarded up, the lighting was poor, and there was no heat. The six initially-enrolled students were young black adults (in their late teens or early twenties). Two additional students enrolled during the first quarter.

The teacher's introduction to PSI was similar to the Site A teacher's introduction; that is, it consisted of a very brief meeting with the researchers immediately prior to the first class. However, since she was familiar with the students and reasonably familiar with mastery learning, self-pacing, and self-instruction, she had no difficulty in understanding the proposed program. Her general attitude appeared to be that she hoped the program would contribute to increased student motivation but, since nothing else had worked with her students, she was not particularly optimistic.

Pretest scores for the four students who were tested indicated performance in language and mathematics at about the fifth grade level. The Tennessee Self-Concept Scale scores for three of the students were above the fiftieth percentile; one score was below the fiftieth percentile. No particular difficulty was encountered with the ABLE test and Tennessee Scale administration.

As with the Site A class, the Site B students had no particular difficulty with the PSI materials. Also, the peer proctor system appeared to function well. Unfortunately, however, the students did very little studying. Students typically were late for class and often left early. The students spent very little time on tasks, but instead talked about social matters, took naps, or simply sat and did nothing. Two students appeared to have slept through the motivational film shown by the researchers. The teacher continued to be pessimistic and discouraged. She frequently told the students that she was going to quit the class if they did not show more interest. Her comments to the researchers were that this was typical of the class behavior for the year that she had been teaching there.

Four weeks into the second quarter, the administrative staff at the cooperating institution informed the Site B teacher that since all but one of her students were also attending high school, they no longer could be enrolled in the ABE program. The class was abruptly cancelled and the teacher given two weeks to either recruit a new class or be discharged. The teacher immediately recruited 15 new students (according to the enrollment/attendance records) and continued with the new class. This was the first indication to the researchers that the original students were high school students. The administrative staff and the teacher apparently had been aware of this for more than a year. Reasons for the institution's acting on this knowledge at such a late date are not precisely known, although there were some indications that the teacher might have been in disfavor with the administrative staff for other unrelated reasons. Also, why the researchers were not informed of this action by the administrative staff is not fully known. (The researchers were told of the action, after the fact, by the teacher. The frequent researcher-initiated visits and telephone contacts with the administrative staff should have provided the staff with ample opportunity to discuss the problem.)

Pretest data were obtained for six of the newly enrolled students. These data are included in the percentages in Table 5.1. Two weeks before the expected end of the second quarter, the teacher was told by the administration to discontinue classes immediately since she already had "used all of her contact hours." No posttest data were collected due to this early termination of the class. Also, due to unusually poor attendance on the part of the new students, practically no work was done on the PSI lessons.

C. Program Implementation in PSI Site C

The PSI Site C class met from 10:00 a.m. to 12:00 a.m. twice each week in a housing project laundry room. The facility was considerably superior to that of Site B, but still far from optimum, particularly on cold days. The teacher, a black female, had earned a master's degree in sociology and worked full time as a social worker. She also had taught ABE part time for several years. She was the only PSI teacher who spent some time with the researchers prior to the beginning of classes. She also was able to review and provide limited comments on some of the instructional materials.

The initial enrollment was four middle-aged black females. Three additional black females enrolled during the first month. Of the four pretested students, three were reading at above the fourth grade level; one was reading at below the third grade level. The self-concept scale scores showed one of the three tested students to have a relatively high self-concept and two to have quite low self-concepts.

As with the students in Site A, the Site C students made reasonable progress with the instructional materials and encountered basically the same types of difficulties noted above for the Site A students. The students seemed initially to be quite docile. The teacher referred to them as her "babies" and treated them accordingly. However, the peer proctor system worked exceptionally well, particularly considering the small size of the class. The students established firm friendships with other class members and frequently studied together in each other's homes between classes. They also frequently telephoned each other for assistance. The idea that students were considered to be capable of helping other students was particularly well received.

The one student who was not in the PSI program received extensive assistance from several of the other students. This student's goal was to be able to follow the words in the Bible when it was read in her church. By the end of the first quarter, she was able to identify a number of words; by the end of the second quarter, she was able to read simple sentences. One PSI student, in particular, considered helping this person to be her primary reason for being in the class. However, test scores indicated that she was, herself, one of the students who showed about a one grade level gain in language and mathematics.

The teacher resigned at the end of the first quarter and was replaced by a young black male attorney. He had had no previous ABE teaching experience but indicated his belief in the value of such programs. He proved to be a competent and dedicated teacher. The students seemed to prosper in the absence of the former mothering environment. They became visibly more assertive and several of them began a strong but friendly competition to see who could make the most progress. One student who had been quite docile during the first quarter was observed telling the teacher, "That's not the way you teach that to her (another of the students). She won't understand that. You have to explain it like this." The student then explained to the teacher how he needed to approach the subject under consideration so as to be understood by the student. One negative aspect of this assertiveness and competitiveness was that students began to attempt to demonstrate mastery without first thoroughly studying the related unit. Records for the second quarter showed 14 instances of students attempting to demonstrate mastery from 2 to 5 times before succeeding.

The new teacher indicated a need for supplementary drill and practice materials in arithmetic. He indicated that he had not been able to get assistance from the cooperating institution in providing either these or any other materials. The researchers obtained the types of materials which he indicated were needed. His were the only specific comments received regarding probable deficiencies in the PSI materials.

D. Description of the Two Comparison Classes

1. Description of Site D

Site D was an on-campus night class of nine students (ten students for the second quarter). The students were black, ages 18 to 76 and, unlike the other classes, about 75 percent were males. Students functioned at from below the third grade level to the eighth grade level. The teacher was a black female who had had four years' experience as a high school teacher. She worked full time as a teacher in a federal prison while teaching part time at Site D.

The instructional approach could be described as traditional, with the teacher attempting to address the needs of the average student and hoping the above-average and below-average students also would profit. Much of the class time was spent in teacher explanations and blackboard work. To the extent practical, individual work was provided to students and limited time spent with each student to assist him/her with particular problems or concerns.

2. Description of Site E

Site E was a housing project class with an enrollment during the first quarter of four students. Only two of these students attended class more than six times. Classes met from 12:30 p.m. to 2:30 p.m. twice weekly. The teacher for the first quarter was the same teacher responsible for Site C discussed above. In Site E, she used a conventional classroom approach except, because of the very limited enrollment, she was able to provide more individual attention.

At the beginning of the second quarter, another community class with equally low enrollment was combined with Site E. The new class had an enrollment of eight. The new teacher, a black female, had an undergraduate degree in political science. This was her first teaching experience. She used the same conventional teaching approach as noted for the first quarter.

Chapter 7

Program Results

This chapter discusses the PSI program results as reflected by data such as number of instructional units completed, pretest and posttest scores on the ABLE and on the Tennessee Self-Concept Scale, and student attendance.

A. Student Progress on Instructional Materials

The number of PSI units completed by students at each site is shown in Table 7.1. Twenty-five of the students mastered a total of 48 language units and 69 mathematics units. Since the lists of unit titles presented in Chapter 3 give a reasonable indication of the content of the units, it can be noted that five of the students completed all or most of the language units on word meaning analysis skills, and six students completed the mathematics unit on computation skills. Five students also completed at least one mathematics unit on fractions.

As was discussed in Chapter 3, since all students began with the first language or mathematics unit regardless of their entry skills, one could reasonably ask to what extent the students' mastery of units could be attributed to their studying the unit rather than to their entry skills. In an attempt to address such questions, the researchers provided the classroom managers with data record forms (see Appendix K) for recording various student inputs. One of the items on the record form asked the students to indicate, after attempting the mastery demonstration for a unit, whether or not they could have mastered the unit if they had not studied the unit. In 21 cases (for 15 mathematics units and 6 language units), the student indicated that he/she could have demonstrated mastery without studying the unit. However, in six of these cases, the student failed to demonstrate mastery and had to restudy the unit before passing. Based upon this evidence, a reasonable conclusion would appear to be that well over 100 units (48 + 69 - 6 = 111) were mastered as a result of studying the PSI instructional materials. Also, in all but one of the 21 cases noted above, the student noted that the unit had been "very helpful." This tends to substantiate the original idea that the early units would provide needed practice even to students who already could master the materials.

With about ten percent of the mastered units, students indicated that they had received help from a proctor in studying the unit. With about six percent of the mastered units, students indicated that they had received help from persons outside of the class. These percentages do not reflect the full extent of the proctoring activities, however, since much of this effort was directed toward assisting students who were not yet studying the PSI materials.

Students tended to provide information on the data record form if the information could be provided by checking the appropriate block. Write-in information, on the other hand, was so sparse as to be of no value in understanding the classroom dynamics.

Table 7.1

NUMBER OF PSI UNITS COMPLETED BY STUDENTS

	First Quarter		Second Quarter		Total	
	Language	Arithmetic	Language	Arithmetic	Language	Arithmetic
Site A						
Student 1	6	6	3	3	9	9
Student 2	1	4	--	--	1	4
Student 3	1	4	4	2	5	6
Student 4	4	6	--	--	4	6
Student 5	6	5	3	1	9	6
Student 6	3	3	--	2	3	5
Student 7	--	--	--	3	--	3
Student 8	1	1	--	--	1	1
Student 9	--	--	--	1	--	1
Student 10	--	1	--	--	--	1
Student 11	--	1	--	--	--	1
Student 12	1	--	--	--	1	--
Site B						
Student 13	1	--	2	--	3	--
Student 14	--	--	--	1	--	1
Student 15	--	--	--	2	--	2
Student 16	--	--	--	2	--	2
Student 17	--	1	--	--	--	1
Student 18	--	1	--	--	--	1
Student 19	--	2	--	--	--	2
Student 20	--	1	--	--	--	1
Site C						
Student 21	1	3	1	1	2	4
Student 22	--	--	--	1	--	1
Student 23	--	--	1	1	1	1
Student 24	1	3	5	1	6	4
Student 25	2	4	1	2	3	6
TOTAL	28	46	20	23	48	69

B. Student Scores on the ABLE Tests

The ABLE tests in reading comprehension, arithmetic computation, and arithmetic problem solving were administered to 36 students near the beginning of their enrollment. The alternate form of the same tests was administered to 21 students near the end of the PSI implementation period. However, because of dropouts and poor attendance, only 15 students were both pretested and posttested (10 PSI students and 5 students from the comparison groups). Test data for these 15 students are presented in Table 7.2. All test scores are presented in grade equivalencies obtained by using the ABLE Handbook conversion tables to convert the raw scores to grade scores. No attempt at comparisons of intact classroom measures was attempted since much of the pretest data was obtained from students who enrolled during the last half of the implementation period.

While considerable caution should be used in interpreting the data presented in Table 7.2, they present some evidence that PSI may have potential as an effective approach to ABE. While no particular gains are indicated for the comparison students, the PSI students show average gains of almost one grade level in reading comprehension and a more than one grade level gain in both arithmetic computation and arithmetic problem solving. Several limitations of these data, other than such obvious limitations as the small sample size and absence of random assignment of students, should be noted. First, the test data are for students who were the "survivors"; that is, they were present at the beginning of the PSI implementation period and still present at the end. Gains for students who enrolled late or withdrew early likely were not as great. Also, as can be noted in both Table 7.2 and Table 5.1, the general academic entry level of the comparison group students was lower than that of the PSI students; therefore, the two groups of students cannot be said to represent the same population of students. In spite of these and other shortcomings of the data, however, the indicated gains for approximately one-third of the PSI students following a maximum of 88 contact hours is an indication that some learning did take place.

C. Student Scores on the Tennessee Self-Concept Scale

The Tennessee Self-Concept Scale was administered to 23 students (15 PSI students and 8 comparison group students) at the beginning of the implementation period and to 21 students (12 PSI students and 9 comparison group students) at the end of the period. As expected, the students' self-concepts were low with the average score being at about the 30th percentile. The scores of the PSI students and control group students were basically identical. Both pre- and post-treatment data were obtained for seven PSI students and five comparison group students. These data are presented in Table 7.3. While a slight increase in self-concept is indicated for the PSI students, and a slight decrease is indicated for the comparison group students, these data should not be interpreted as clear evidence that the PSI program contributes to increased self-concept. The sample sizes are so small and self-concept scales are so subject to temporal, incidental factors that as simple a factor as a speeding ticket received on the way to class by a single student could have contributed to the small differences shown. The data can, however, be interpreted as one indication that PSI did not contribute to any major lowering of the students' self-concepts.

Table 7.2

PRETEST AND POSTTEST DATA FOR PSI AND COMPARISON GROUP STUDENTS, IN GRADE EQUIVALENCIES

	Pretest Scores			Posttest Scores		
	Reading Comprehension	Arithmetic Computation	Arithmetic Problem Solving	Reading Comprehension	Arithmetic Computation	Arithmetic Problem Solving
Site A[b]						
Student 1[a]	9.0	4.9	6.4	Higher than 9.0	6.4	3.6
Student 2	Less than 3.0	Less than 3.0	Less than 3.0	5.0	3.7	Less than 3.0
Student 3	9.0	4.9	Less than 3.0	Higher than 9.0	6.8	5.8
Student 4	7.8	5.5	6.8	8.4	Higher than 9.0	8.2
Student 5	7.2	4.4	Less than 3.0	Higher than 9.0	6.0	Less than 3.0
Student 6	6.6	5.5	Less than 3.0	6.6	6.7	Less than 3.0
Student 7	8.4	4.9	Less than 3.0	8.4	7.6	Higher than 9.0
Site C[b]						
Student 8	8.0	4.6	3.0	8.7	6.0	5.0
Student 9	4.3	5.8	Less than 3.0	4.4	6.6	3.6
Student 10	Less than 3.0	Less than 3.0	Less than 3.0	3.9	3.7	Less than 3.0
Site D[c]						
Student 11	4.5	3.2	Less than 3.0	5.6	3.2	Less than 3.0
Student 12	Less than 3.0	Less than 3.0	Less than 3.0	Less than 3.0	Less than 3.0	Less than 3.0
Student 13	Less than 3.0	Less than 3.0	Less than 3.0	Less than 3.0	Less than 3.0	Less than 3.0
Student 14	Less than 3.0	Less than 3.0	Less than 3.0	Less than 3.0	3.4	Less than 3.0
Site E[c]						
Student 15	6.6	5.2	3.9	5.6	5.6	4.2

---

[a] The student numbers used in this table are for convenience only. Student 1 in this table is not necessarily the same individual as Student 1 in the other tables in this chapter.

[b] PSI sites.

[c] Comparison sites.

Table 7.3

SCORES ON THE TENNESSEE SELF-CONCEPT SCALE, IN PERCENTILES

	Pretreatment Scores	Posttreatment Scores
Site A[b]		
Student 1[a]	72	77
Student 2	51	63
Student 3	9	22
Student 4	4	14
Site C[b]		
Student 5	21	18
Student 6	3	5
Student 7	67	35
Average for PSI Students	32	33
Site D[c]		
Student 8	48	50
Student 9	49	64
Student 10	68	14
Site E[c]		
Student 11	1	4
Student 12	30	8
Average for Comparison Group Students	39	28

[a] The student numbers used in this table are for convenience only. Student 1 in this table is not necessarily the same individual as Student 1 in the other tables in this chapter.

[b] PSI sites.

[c] Comparison sites.

D. Student Enrollment and Attendance

This section discusses student enrollment and attendance in the three PSI classes and the two comparison classes. Student enrollment is presented in Table 7.4. As is shown there, enrollment generally was higher and for longer periods of time during the second quarter. The one major exception was primarily due to several unusual factors noted in Chapter 6; that is, the large number of Site B second quarter students enrolled for less than 11 days was largely a result of most of the beginning students being dismissed after eight classes and new students being recruited near the end of the quarter.

Student attendance is presented in Table 7.5. The average student attendance for the combined PSI classes for both quarters was 71 percent as compared to an average student attendance for the combined comparison groups for both quarters of 69 percent. While this difference is relatively insignificant, making adjustments for one known factor would significantly widen the differences. Attendance by the Site B students who were recruited in the middle of the second quarter was exceptionally poor. For all practical purposes, the PSI program at Site B ended at the eighth class session of the second quarter. After that, no PSI materials were used. If Site B enrollment and attendance records for the remainder of the quarter are omitted from the calculations, the attendance rate for the PSI classes would be 76 percent.

E. Student Dropout Rate

The student dropout rate was computed for all students enrolled in the three PSI classes and the two comparison classes during the first month of the first quarter. Of a total of 24 such students in the PSI classes, 21 percent dropped out before the end of the second quarter.[7] The dropout rate for the seven similarly enrolled comparison class students was 57 percent. One reason for the small number of students included in the comparison class computation was that Site D enrollment was very slow during the first month of the first quarter. If all students enrolled during the first quarter are included, the dropout rate for the included 29 PSI students would be 24 percent, and the rate for the 13 comparison group students would be 62 percent.

---

[7] This 21 percent dropout rate is based on the assumption that five Site B students who were forced to drop out at the end of the eighth class session of the second quarter were not dropouts, but would have continued to be enrolled for the remaining sessions had they been permitted to do so. If these students are not included in the computation, the dropout rate is 26 percent.

Table 7.4

NUMBER OF STUDENTS ENROLLED, BY ENROLLMENT PERIOD CATEGORIES

	Number of Days of Enrollment		
	20-22	11-19	Less than 11
First Quarter			
Site A[a]	8	3	3
Site B[a]	6	1	1
Site C[a]	3	4	--
Site D[b]	2	4	3
Site E[b]	3	--	1
Second Quarter			
Site A[a]	16	2	--
Site B[a]	--	7	14
Site C[a]	5	--	--
Site D[b]	7	3	--
Site E[b]	3	5	--

[a] PSI sites.

[b] Comparison sites.

Table 7.5

AVERAGE STUDENT ATTENDANCE, IN PERCENTAGES[a]

	First Quarter	Second Quarter	Total
Site A[b]	79	67	72
Site B[b]	64	53	57
Site C[b]	75	94	88
Site D[c]	52	67	61
Site E[c]	65	88	80

[a] Percentages are computed by dividing the total student/days of attendance by the total student days of enrollment.

[b] PSI sites.

[c] Comparison sites.

Chapter 8

Summary and Conclusions

This chapter provides a brief summary of the research reported herein, a list of the significant findings, and a discussion of the major conclusions that can be drawn.

A. Summary of the Research Activities

The primary objective of the study reported herein was to answer the question: "Is further investigation of the use of PSI for nontraditional adult learners likely to be worthwhile?" A secondary objective was to identify potentially fruitful areas for further investigation. To address these objectives, a PSI/ABE program intended to teach fourth to eighth grade level reading comprehension and mathematics was developed and implemented with three groups of adult students. The implementation period extended over a six-months' period and included a total of 88 hours of classroom activities.

The students were predominantly black females. The entry level in reading of about one-third of the students was found to be below the fourth grade level. This resulted in remediation having to be provided to these students before they could begin the PSI lessons. Student enrollment ranged from about five students in the smallest class to about 15 in the largest class.

The program implementation encountered relatively few student-related problems but encountered a number of teacher-related and institution-related difficulties. The socializing potential of PSI was noted in the close personal contacts among students. The self-pacing feature of the program worked exceptionally well, and, after some initial difficulties, the mastery concept appeared to be a positive factor. The idea of students helping students was well received and led to friendly competition and to after-class cooperation among students in studying the PSI instructional materials.

One teacher had a "mothering" attitude that appeared to minimize student self-assertion. Another teacher managed his class as planned for most of one quarter and then increasingly moved away from the planned implementation toward a conventional classroom lecture/demonstration approach. This change appeared to be supported by institutional factors such as an apparent need to move students out of the ABE program into a GED program. Institutional factors also drastically limited teacher training activities and led to the disruption and eventual termination of one class.

B. Summary of Research Results

The PSI students completed over 100 units of language and mathematics instruction. Scores on ABLE tests indicated almost a grade level increase in reading comprehension, and more than a grade level increase in both arithmetic computation and arithmetic problem solving for those students who were available for both pretesting and posttesting. In contrast, students from comparison classes showed practically no changes in pretest to posttest scores.

Scores on the Tennessee Self-Concept Scale indicated that many of the ABE students had very low self-concepts. The average pre-treatment and post-treatment score was at about the thirtieth percentile. But little difference was noted between the PSI students and the comparison group students.

Average student attendance was quite high at about 70 percent. But little difference was noted between the PSI classes and the comparison classes.

The dropout rate for the PSI classes was about 25 percent; the dropout rate for the comparison classes was about 60 percent.

C. Conclusions

This section discusses some conclusions based upon the synthesis of research findings on PSI and on adult learning provided in Volume I, and upon the developmental and implementation activities summarized above. The emphasis here is upon conclusions directly related to the questions addressed by the research; that is, upon answering the questions: (1) Is further investigation of the use of PSI for nontraditional adult learners likely to be worthwhile? and (2) What are some potentially fruitful areas for further investigation?

The synthesis of previous research findings provided considerable evidence that PSI might be a particularly effective approach to teaching nontraditional adult learners. For example, the mastery requirement and self-pacing feature of PSI appear particularly suitable for nontraditional adult students who may be lacking in self-confidence and thus need an opportunity to succeed, and who need to work at their own pace because of varying levels of achievement, capability, and competing demands on their time. The use of peer-proctors in PSI appears to be an excellent approach to providing the social, interactive element typically sought by nontraditional adult students.

The implementation activities and results summarized above also indicate that PSI may have the potential for effective teaching of nontraditional adult learners. In the implemented program, the students did learn. They were enthusiastic about the program, and they readily adapted to the idea of students helping students.

The answer to the research question regarding whether or not further investigation of the use of PSI for nontraditional adult learners is likely to be worthwhile is an emphatic "yes." PSI appears to hold considerable promise for combining some of the best features of recent technological developments with sound educational principles and practices into a program for addressing needs such as those of adults who lack the basic skills for functioning in a modern technological society.

The current research activities not only indicate a potential role for PSI in teaching nontraditional adult learners, but also indicate a need for further research to define that role. Following is a list of potentially fruitful areas for such research. This list is based upon the researchers' interpretation of the findings of the current research and suggestions from various reviewers[8] of this report. The questions are considered by the researchers to represent, as a minimum, examples of the types of issues that should be addressed to ensure that the potential of PSI for teaching nontraditional adult learners is realized. While each question is reasonably independent of the others, some overlap exists.

---

[8] See Preface and Acknowledgements.

(1) Questions Related to PSI Materials

- What PSI instructional materials are needed for specific potential implementations (e.g., for ABE students)? What should be the objectives to be met by the instruction (e.g., to what extent should the emphasis in an ABE program be on teaching "life skills" as opposed to teaching the traditional 3Rs?) How does a "good" teacher teach? Can significant teacher activities that result in superior learning be "packaged" for use in PSI?
- What PSI instructional materials are available for meeting what objectives? To what extent have these materials been validated? Under what conditions were they validated?
- How can the gap (if one is found to exist) between instructional material needs and material availability most effectively and efficiently be narrowed?
- To what extent should reliance be placed upon self-instructional materials as the primary source of instruction as opposed, for example, to reliance on peer proctors?
- What is the role in PSI of packaged instruction other than printed materials (e.g., audio tapes for teaching reading)?
- What choices as to instructional content can best be left to the individual student?
- What is the role in PSI of diagnosis and description? What instruments and procedures work best?
- What would be the results in PSI of minimizing instruction as a distinctive element, and maximizing testing (i.e., using extensive testing as the primary method of teaching)? (Note: Several research activities reported in Volume II, Chapter 2 indicated that students who routinely took mastery tests before thoroughly studying the materials generally ended up mastering the materials anyway. This raises a question as to what extent traditional instructional materials are essential to learning.)
- What is the nature of the cognitive skills[9] employed by students in the acquisition of new knowledge, problem solving, and reasoning? What instructional materials and strategies can aid students in improving their cognitive skills?

---

[9] Cognitive skills are defined here as a set of heuristics or methods that a person employes to regulate internal processes associated with problem solving, learning, memory, and/or reasoning (cf. Bruner, Goodnow, and Austin, 1956; Gagné, 1975; Newell and Simon, 1972).

(2) Questions Related to the Mastery Requirement of PSI

- What are the effects of various rewards for mastery (e.g., certificate of completion, field trip) on student performance?

- What are the effects of various mastery requirements (e.g., 100 percent requirement, 80 percent requirement, student-determined requirement) on student performance? How do these effects vary with the nature of the instructional objectives?

- How can students best be introduced to PSI so that frequent testing and the mastery requirement result in positive learning experiences?

(3) Questions Related to Self-Pacing

- To what extent is student pacing based upon student ability as opposed to student motivation (or procrastination)?

- What is the effect of scheduled study time on time on task? How does fixed scheduling compare to flexible scheduling?

- How can students be motivated to spend more time on task?

(4) Questions Related to the Use of Peer Proctors

- What are the relative advantages and disadvantages of internal proctors (i.e., proctors who also are students in the class) vs. external proctors (i.e., proctors who are not students in the class)?

- What are the advantages to the proctor of serving as an internal proctor? What are the advantages and disadvantages of various reward systems?

- What training should be provided to internal proctors? To external proctors?

- What evidence can be found of successful proctoring? What factors appear to contribute to proctor "success"? To what extent should the proctor be a "teacher"? A motivator? A social contact?

(5) Questions Related to Motivational Lectures

- Do motivational lectures make a difference in student performance? Under what conditions?

- What are some effective motivational lecture options (e.g., movies, social events, sessions on communications and human relations)?

(6) Questions Related to the PSI System

- What are optimum classroom characteristics (e.g., class size, class groupings, meeting time and location, resources)?
- What effects do various student, proctor, teacher, and system characteristics have on short-term and long-term student behaviors?
- What is the legitimate role of the teacher in PSI? How can this role be enhanced so as to meet the teacher's personal and professional needs?
- What are the positive and negative outcomes of PSI? How can these outcomes be measured?
- How can the cost effectiveness of PSI be determined? How cost effective is PSI as compared to other teaching approaches?

APPENDICES

The appendices have been omitted as an economy measure. However, a copy may be obtained by contacting:

Dr. Jerome Lord
National Institute for Education
1200 19th St., N.W., Room 816K
Washington, D.C. 20208
(202)254-5706

Appendix A

Tennessee Self-Concept Scale Answer Sheet

STUDENT'S NAME ____________________________________

Responses:

Completely false	Mostly false	Partly false and partly true	Mostly true	Completely true
1	2	3	4	5

Put a circle around the response number you have chosen for each statement.

1. 1 2 3 4 5
2. 1 2 3 4 5
3. 1 2 3 4 5
4. 1 2 3 4 5
5. 1 2 3 4 5
6. 1 2 3 4 5
7. 1 2 3 4 5
8. 1 2 3 4 5
9. 1 2 3 4 5
10. 1 2 3 4 5
11. 1 2 3 4 5
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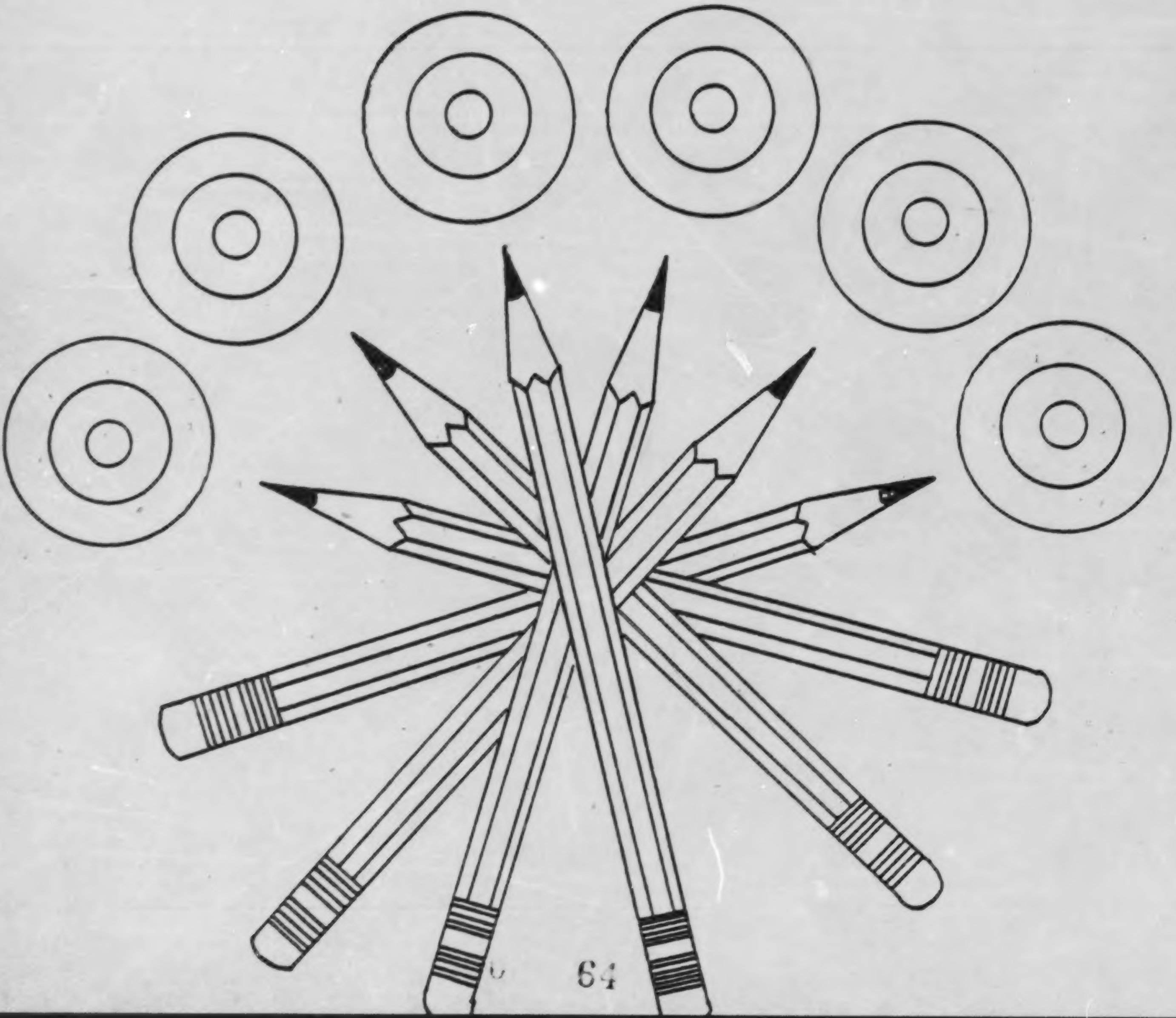
97. 1 2 3 4 5
98. 1 2 3 4 5
99. 1 2 3 4 5
100. 1 2 3 4 5

Appendix B

What is PSI?

WHAT IS PSI?



You are about to take part in an important project. The National Institute of Education (NIE) in Washington has given the money for this special PSI course to be developed for Adult Basic Education students to use. You will be the first people to use this PSI program. If you find the program to be helpful, it may be used in other ABE classes all over the United States. We hope you will choose to give this PSI program a good try. Once you have learned everything in the PSI units, you will have mastered important skills which you should then be able to put to use in your real life.

BILLS
TAX
RECEIPTS

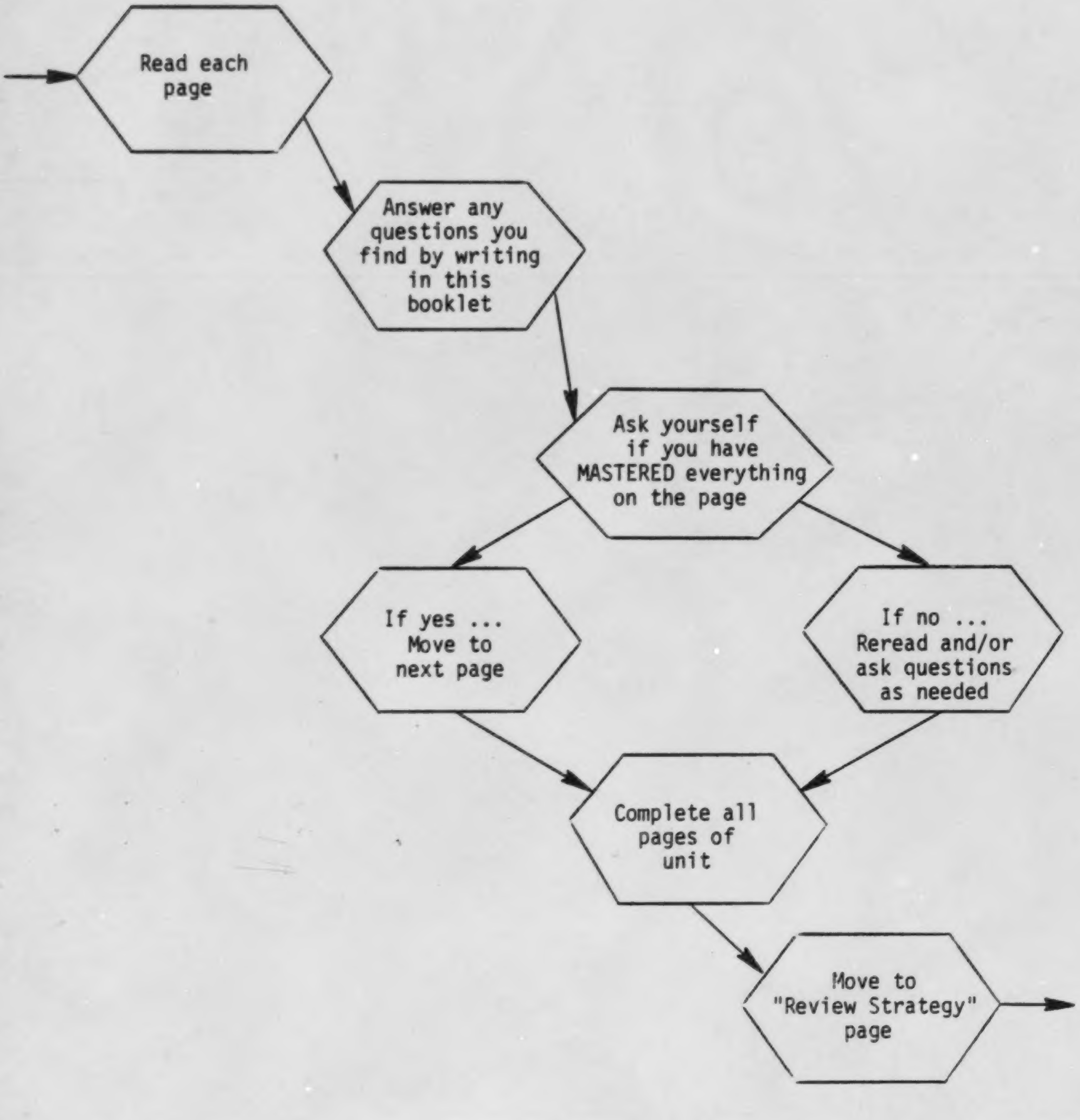
INTRODUCTORY UNIT:
WHAT IS PSI?

UNIT OBJECTIVE: When you have read this booklet, you will know what a PSI course is and what you need to do to use it.

Reaching this objective will help you to make full use of the PSI materials to move toward your goals.

Reaching this objective will also help you to understand what else you can expect during a PSI course.

SELF-TEACHING STRATEGY


Read each page
Answer any questions you find by writing in this booklet
Ask yourself if you have MASTERED everything on the page
If yes ... Move to next page
If no ... Reread and/or ask questions as needed
Complete all pages of unit
Move to "Review Strategy" page

PSI stands for PERSONALIZED SYSTEM OF INSTRUCTION. It is a learning method based on five ingredients.

MASTERY GOALS: You will study each unit until you have MASTERED it.

WRITTEN MATERIALS: You will be using written unit booklets to learn and to practice the material you need to master.

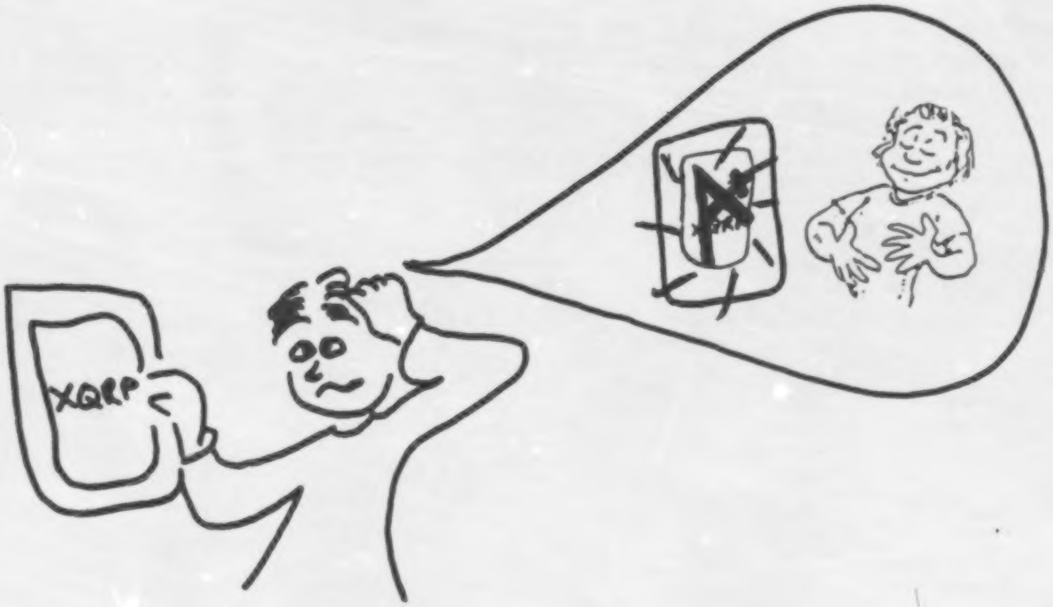
SELF-PACED: You will be moving at the speed you select.

PROCTORED BY PEERS: Students in your class will give you any help you need.

GROUP ACTIVITIES: You will be invited to special group activities, such as movies.

LESSON 1:

MASTERY GOALS



In PSI, you study one unit of material until you master it. This is called MASTERY learning.

You have probably already done some other kinds of MASTERY learning. When you learned to drive a car or to cook chicken, you kept on going over it until you had MASTERED it. That's what mastery learning is.

PSI is also MASTERY learning. Many people who take PSI classes are worried when they hear about the PSI mastery goals and then are surprised and proud when they find out that they can reach those MASTERY goals after all.

When you have learned something at the MASTERY level, 1) you will have conquered it, and 2) you will know how to use it whenever you need it.

Which of these is MASTERY LEARNING? (Check one)

___1. You learn just enough about something to get by on a test.
___2. You learn just enough about something to know more than your brother.
___3. You learn all you need to know about something to be able to use it whenever you need it.

If you marked 3 above, you are right! If you marked 1 or 2 you need to return to page 5 and read again about MASTERY learning.

How will you know when you have reached MASTERY of a unit in this PSI program? This PSI program has included three tools for you to use to find out whether you have MASTERED each unit.

MASTERY DEMONSTRATION TOOLS:

Tool 1. Each lesson in the unit has practice questions with an answer key.
Tool 2. Each unit has a "Practice Mastery Demonstration" for you to give yourself.
Tool 3. Each unit has a "MASTERY Demonstration" which will be given to you by a proctor.

If you find out from any of these three tools that you have not MASTERED a unit, you will then know that you need to spend more time studying that unit before you are finished with it.

All of these MASTERY demonstration tools are for you to use to make sure that you have learned as much about each topic as you will need to know to be able to put it to use in real life.

In order for PSI to work for you, you will need to follow the rules in the next 4 boxes.

RULE 1: Study each unit until you are sure that you know it. Have your proctor give you the unit "MASTERY DEMONSTRATION" as many times as you need to to reach complete MASTERY.

RULE 2: If you have trouble with a unit MASTERY DEMONSTRATION, wait at least one day to take it again and use the extra time for studying and practicing with that unit.

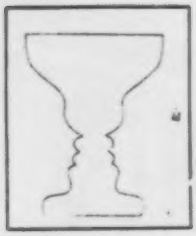
__RULE 3__: Do not use books or ask for help from proctors, teachers, or friends while you are taking a MASTERY demonstration.

__RULE 4__: Do the units in the correct order, since each unit will depend on your having MASTERED the unit that comes before it.

On the next page are some pictures to show how you can sometimes surprise yourself when you finally are able to do something that you at first think you can't do. PSI is often like that. You may be very surprised to discover how much you __can__ do if you MASTER just __one__ piece at a time.

DEMONSTRATION

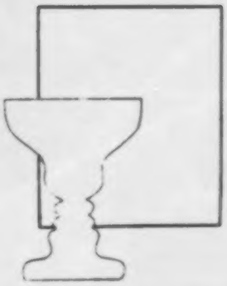
(The IMPOSSIBLE becomes POSSIBLE)



What do you see in this picture? ____________________

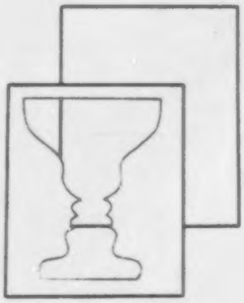
Do you see anything else in this picture?

____



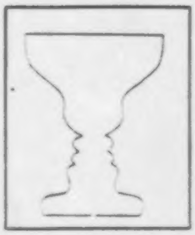
What do you see in this picture?

____



What do you see in this picture?

____



Now do you see in this picture both 1) a vase, and 2) two people looking at each other?

LESSON 2:

WRITTEN MATERIALS

MODULE I
Unit 1
Addition

You will be using written unit booklets to study for each MASTERY demonstration. Some of the booklets teach reading skills and some teach MATH skills.

The unit booklets are yours to keep. You may feel free to write in them, take them home, collect them for future review, or lend them to a friend.

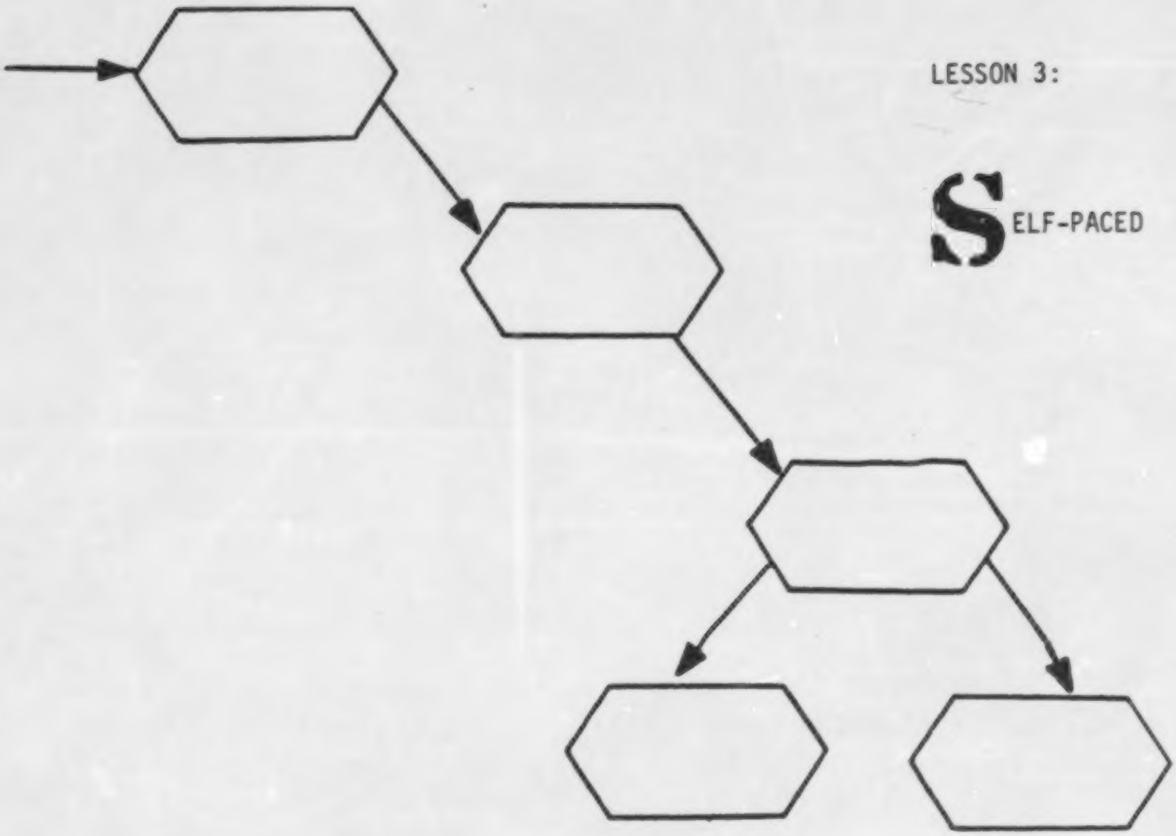
If something in the written units is hard to understand, tell the teacher or write a note to us, the PSI writers. We want to know what places in these materials need to be fixed.

You may want to ask questions or get help on some units, but, in the end, you will need to demonstrate MASTERY without anyone's help, so you should work alone as much as you possibly can.

When you finish a MATH unit you will be given the next math unit, and when you finish a READING unit you will be given the next reading unit.

LESSON 3:

SELF-PACED



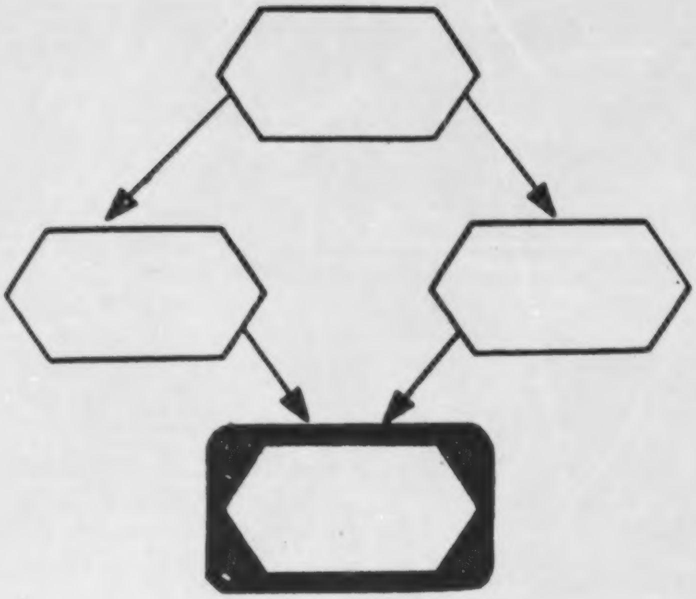
You will decide for yourself how fast you want to move through this PSI program. Of course, the more you move along the more units you will receive and the more you will learn.

This PSI program will work best for you if you spend about half of your time on the MATH units and half of your time on the READING units.

You will decide when you are ready to go to a proctor to take the MASTERY DEMONSTRATION. However, you will need to pick a time during the time scheduled for your class to meet.

If you cannot find a proctor when you are ready to take a MASTERY DEMONSTRATION, you may ask the teacher to help you find one.

LESSON 4: PROCTORED BY PEERS



In this PSI program you will have the chance to be proctored by other students in your class (peers). You will also have the chance to proctor other students on units you have already MASTERED.

There will be a PROCTOR Chart posted in the room where your class meets. Each time a student masters a unit, his or her name will be written on the chart and he or she will then be qualified to be a proctor for that unit.

If you need a proctor to answer a question or to give you the MASTERY DEMONSTRATION for a unit, look at the Proctor Chart to find out who can be proctor for that unit.

You may select any proctor (listed on the proctor chart) who has shown MASTERY of the unit you have just finished.

Since your proctor mastered the unit just before you did, he/she will be able to help you get through it now.

When you master a unit you may then be asked to proctor other students on that unit. Proctoring other students will give you a chance to review and practice what you have learned until you know it even better.

When you are asked to proctor another student, you will be given a booklet that will tell you how to do it.

Ancient Monuments and Mysteries
Ancient
Digging Up America's Past

LESSON 5: GROUP ACTIVITIES

You will be invited to come to group activities such as movies, talks, and discussions.

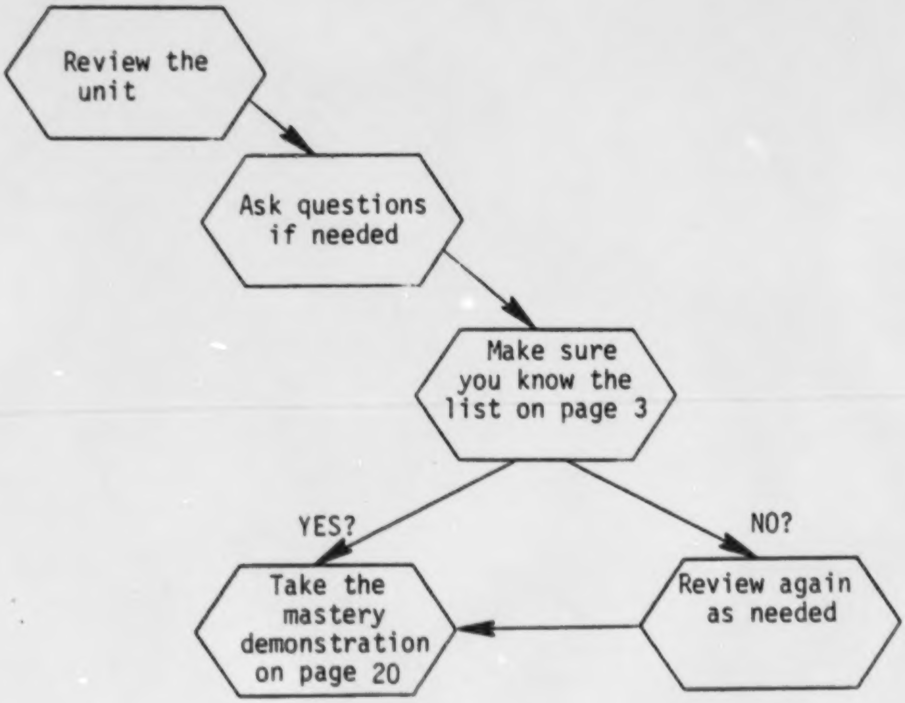
You will not be asked questions about the group activities when you take Mastery Demonstrations.

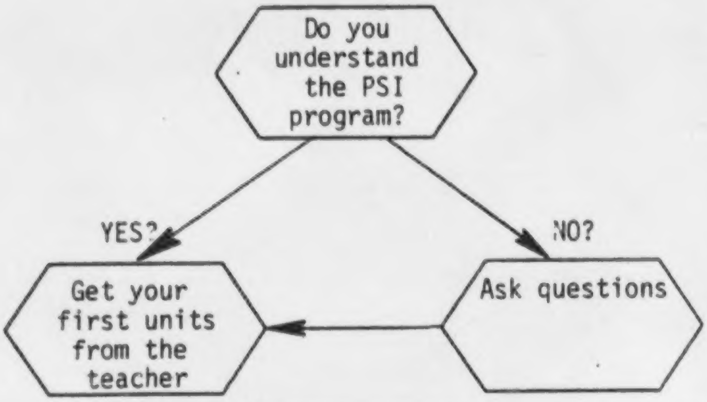
You are now ready to review this unit, after which you will demonstrate your mastery of the unit. You will take the mastery demonstration yourself and then check your own responses.

When you have demonstrated mastery of this unit, you will be ready to move on to the next unit.

Go to the next page

REVIEW STRATEGY

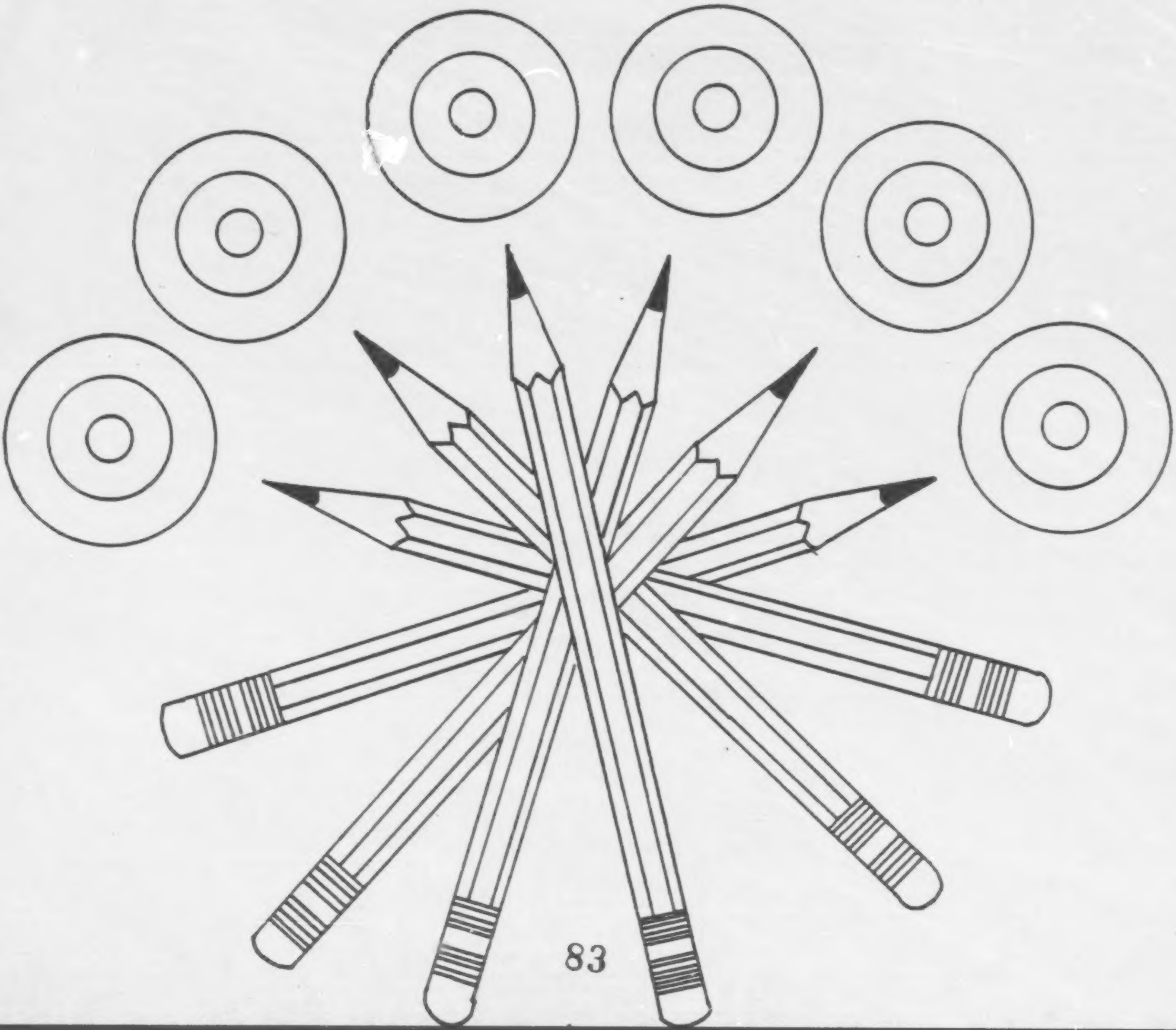

Review the unit
Ask questions if needed
Make sure you know the list on page 3
YES?
NO?
Take the mastery demonstration on page 20
Review again as needed


Do you understand the PSI program?
YES?
NO?
Get your first units from the teacher
Ask questions

Keep this unit for future use

MASTERY DEMONSTRATION

What is PSI?



1. What are the _five_ ingredients of PSI?

   a. ______________________________

   b. ______________________________

   c. ______________________________

   d. ______________________________

   e. ______________________________

2. In this PSI program, you will do your work using _____(circle one)_____.

   a. teacher lectures

   b. written booklets

   c. the library

   d. videotapes

3. In this PSI program, your work speed will be selected by

   _____(circle one)_____.

   a. your teacher

   b. your proctor

   c. you

   d. your job

4. You will start a new unit only after

   a. you go to a group activity

   b. you finish reading the unit

   c. you fill in all the blanks in the unit

   d. you demonstrate mastery of the unit

5. When you do MASTERY learning you study the material until

   a. you know it a little bit

   b. you know it well and can show that you know it

   c. you think that you know it

   d. you know more than the rest of the class

6. What is a peer proctor?

   a. the teacher

   b. one of the students in the class who has already mastered that unit

   c. any of the students in the class

   d. somebody outside of the class who knows the subject

7. What does "self-paced" mean?

   a. you work along with the teacher

   b. you work at the same speed as the rest of the class

   c. you work at the speed you select for yourself

   d. you work according to the schedule set by the PSI program

Answers are
on next page

ANSWERS TO MASTERY DEMONSTRATION

1. mastery goals
   written materials
   self-paced
   proctored by peers
   group activities
2. b
3. c
4. d
5. b
6. b
7. c

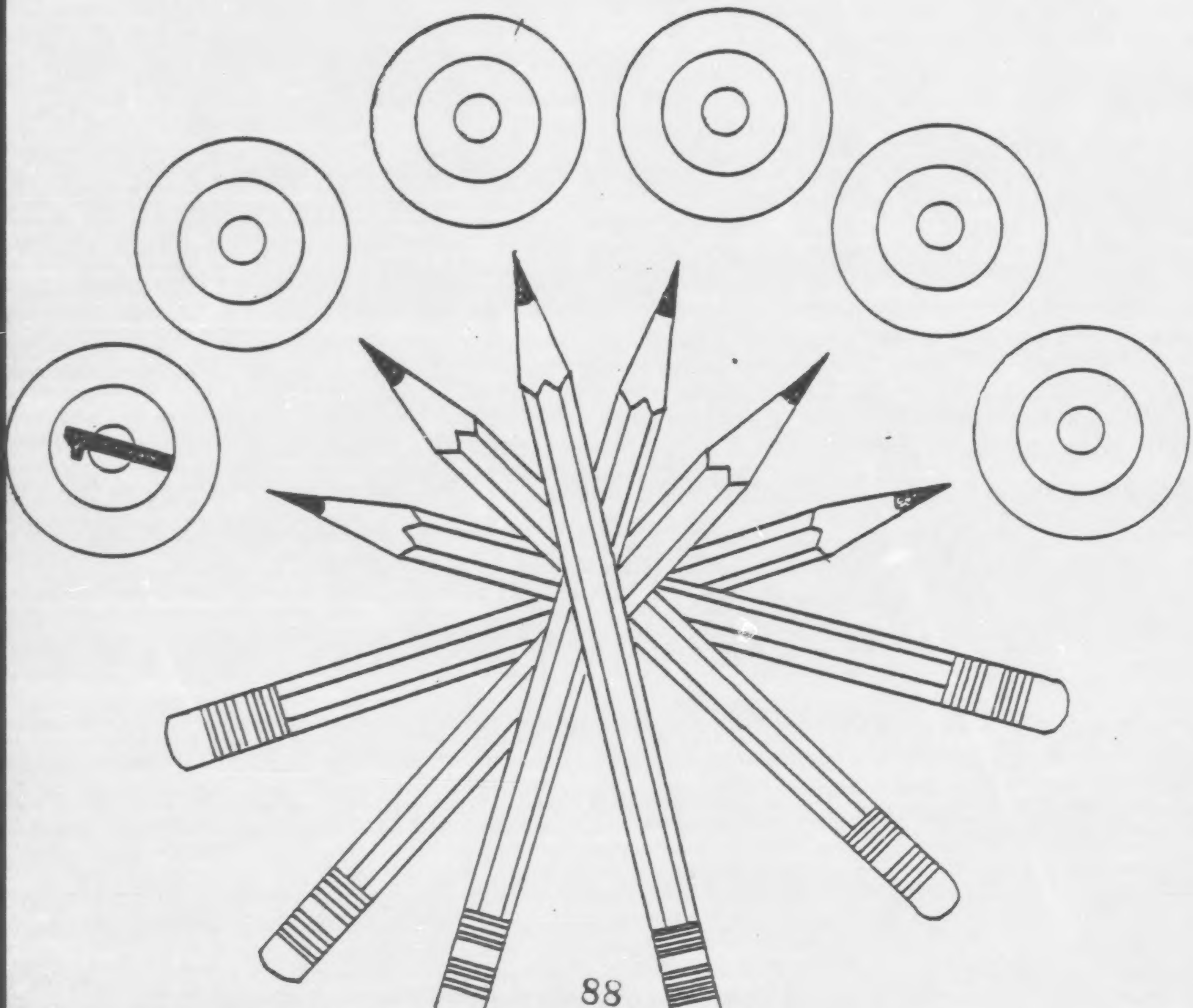
Appendix C

Sample Language Unit

LANGUAGE MODULE I

Unit 1

PREFIXES



OBJECTIVE: When you have completed this unit, you will be able to use prefixes to analyze the meanings of words.

The MASTERY of this objective will make it possible for you to determine the meanings of words you have never before seen.

The MASTERY of this objective will help you add new words to your vocabulary while you read and without outside help.

In this unit, you will master the following prefixes:

un- p. 5
in- p. 7
re- p. 10
dis- p. 12
pre- p. 14
anti- p. 15
mis- p. 16
semi- p. 17
post- p. 18
super- p. 19
bi- p. 20
tri- p. 21
non- p. 22
en- p. 23

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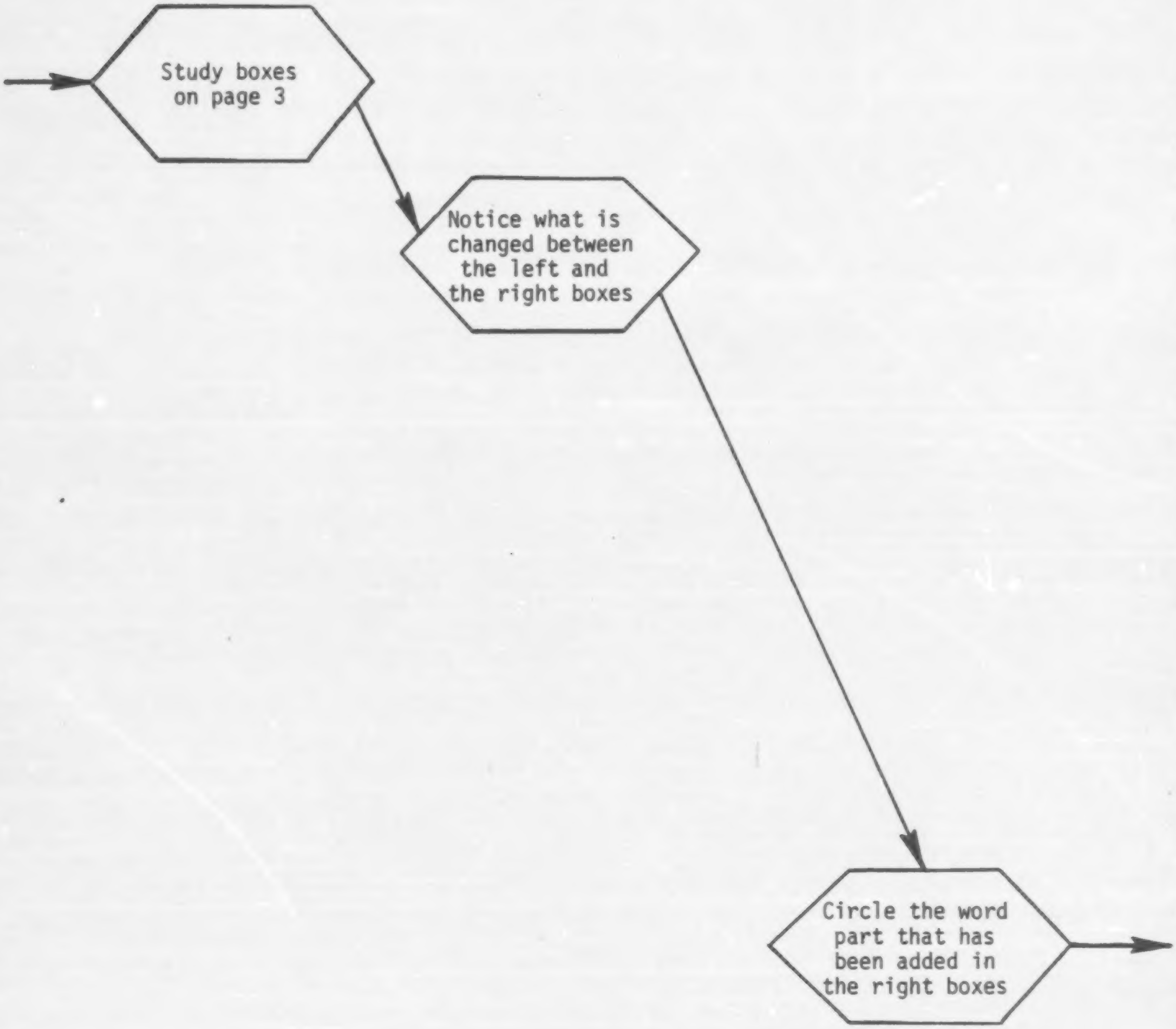
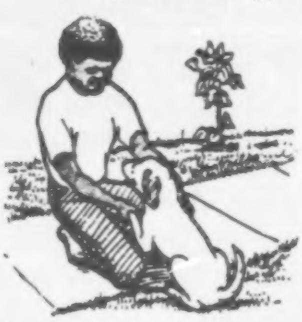
A Division of Intext

SELF-TEACHING STRATEGY

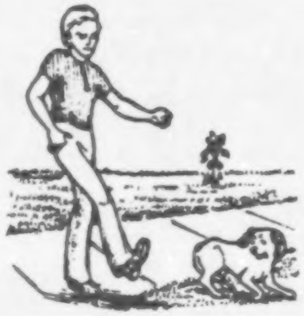

Study boxes on page 3
Notice what is changed between the left and the right boxes
Circle the word part that has been added in the right boxes

Prefixes

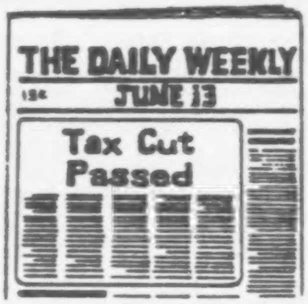
A Read the sentences. Look closely at the words and parts of words in dark type.



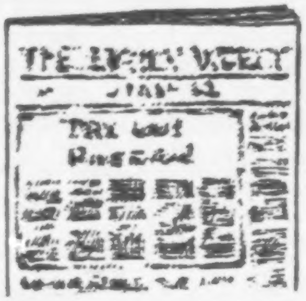
This man is kind.



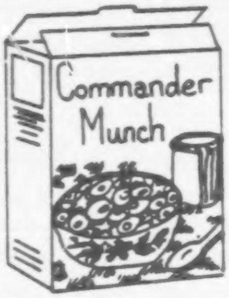
This man is not kind.
He is unkind.


THE DAILY WEEKLY
15¢
JUNE 13
Tax Cut Passed

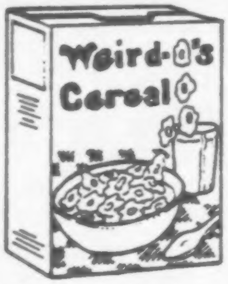
These letters are clear.



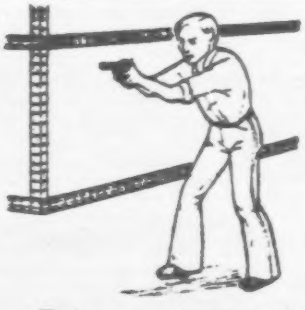
These letters are not clear.
They are unclear.


Commander Munch

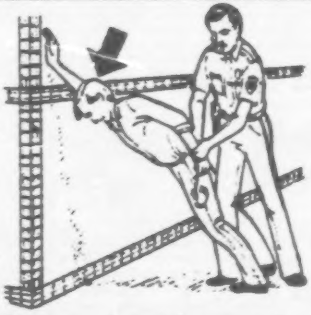
This box is opened.


Weird-O's Cereal

This box is not opened.
It is unopened.



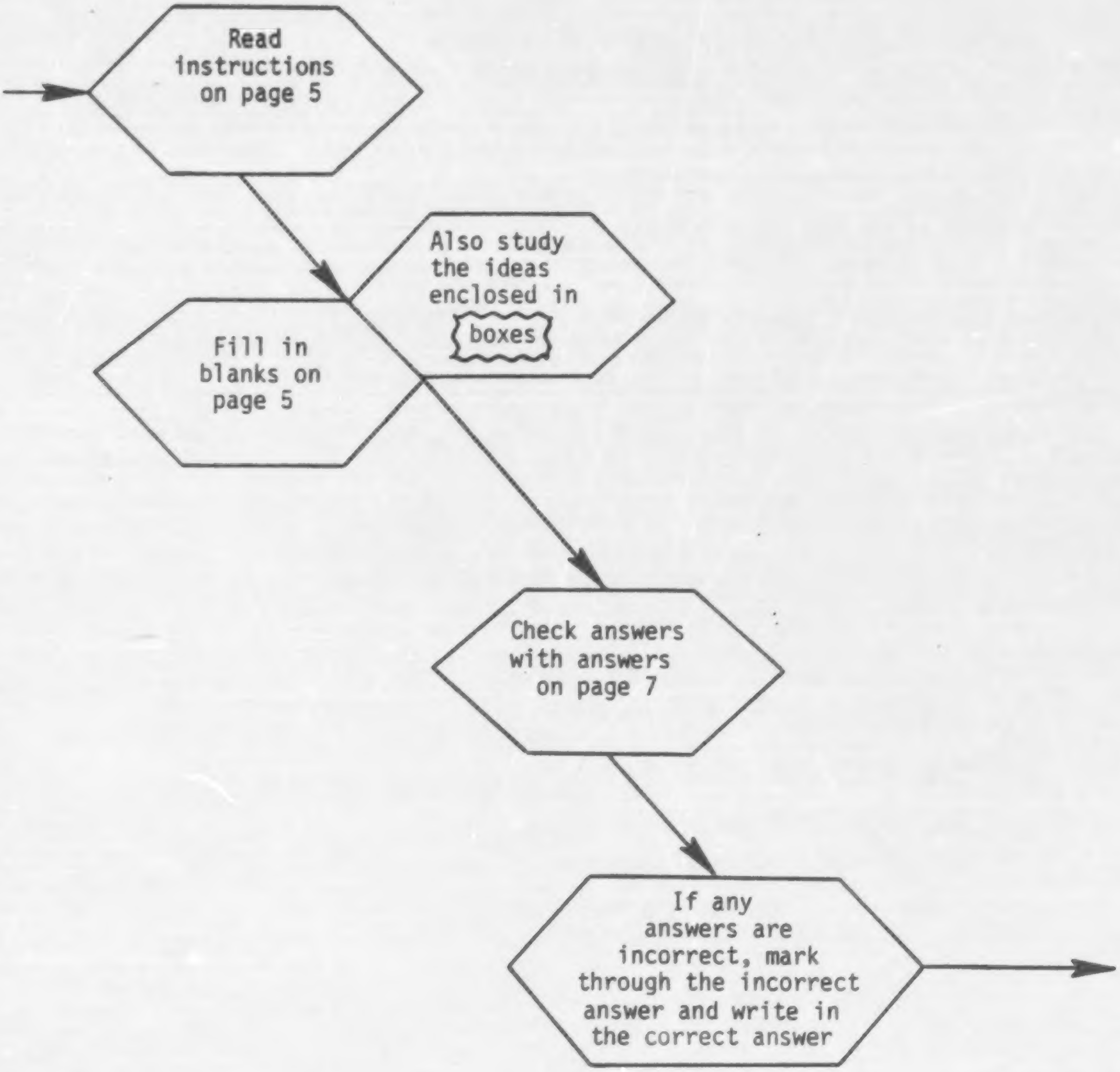
This man is armed.



This man is not armed.
He is unarmed.

Go to the next page

SELF-TEACHING STRATEGY


Read instructions on page 5
Also study the ideas enclosed in boxes
Fill in blanks on page 5
Check answers with answers on page 7
If any answers are incorrect, mark through the incorrect answer and write in the correct answer

Prefixes: un-

B Look at the words and parts of words in dark type on page 3. Fill in the blanks below.

1. Write the word part that was added to words on page 3.

   ....

2. *Unkind* means .... kind.
3. *Unclear* means .... clear.
4. *Unopened* means .... opened.
5. *Unarmed* means .... armed.
6. When *un-* is used with a base word, it means ....

> Un- is a prefix. A prefix is a word part at the beginning of a word. A prefix can change the meaning of the word. Un- means "the opposite of" or "not."

C Write the meaning of each underlined word.

1. It had rained for several days. The farmer could not do any work. The farmer's work was left undone..............................
2. Bob was the last to be hired. Now the company was not doing well. Bob's future with the company was uncertain.

   ....

3. Heather always had nice things to say to others. Today she yelled at Tasha. This was unlike Heather..............................
4. Tony almost never spoke in class. He thought that what he had to say was unimportant. ....
5. The Garcias tried to save money, but prices seemed to keep going up. They have been unable to save anything this month. ....

D Fill in the blanks.

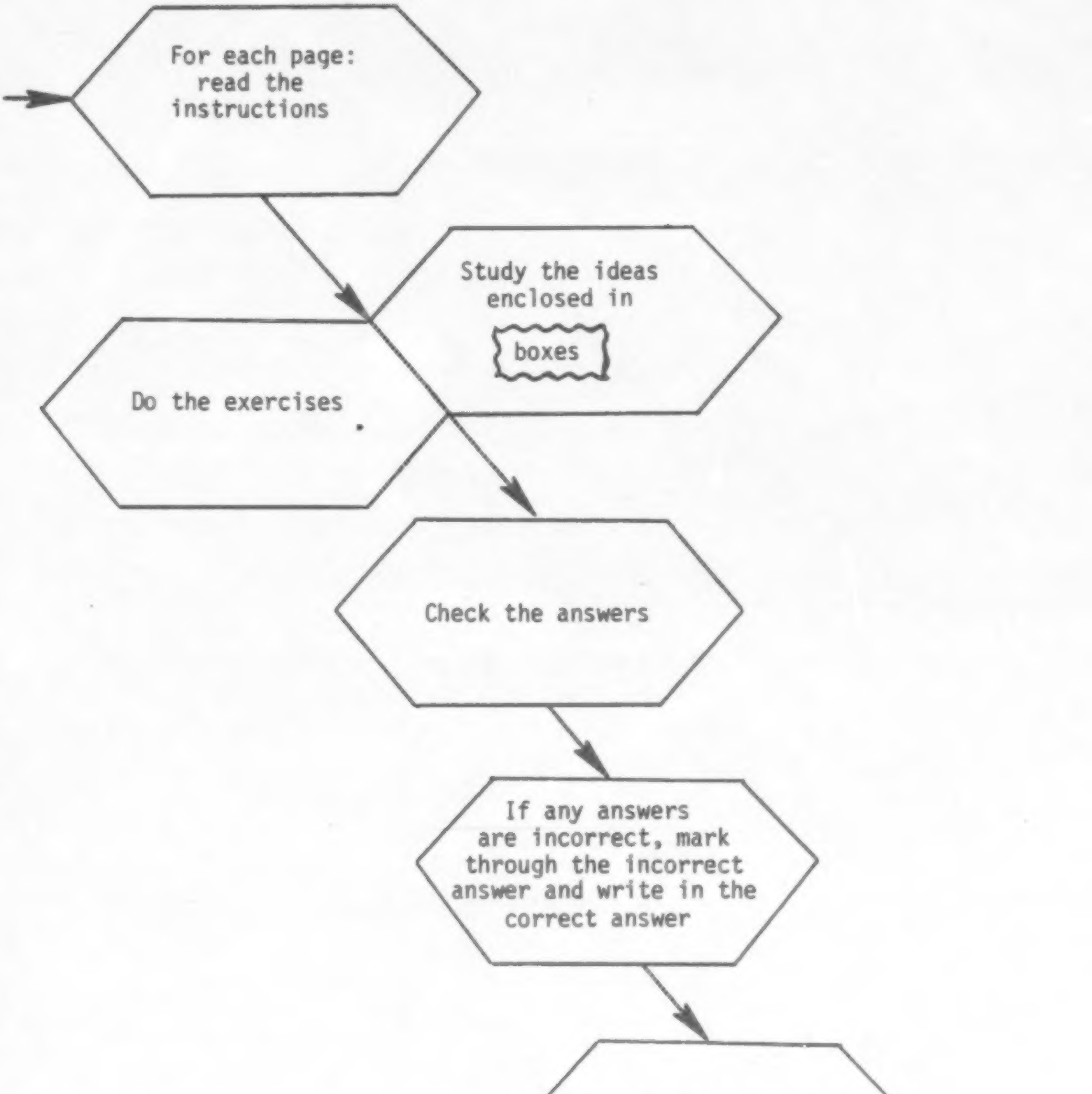
A .... is a word part. It comes at the .... of a word. A prefix can .... the word meaning.

> In this book, prefixes will be shown with a hyphen (-) when they are written alone. Remember to leave the hyphen out when you join a prefix to a word.

Go to Page 6

Answers are on Page 7

SELF-TEACHING STRATEGY


For each page: read the instructions
Study the ideas enclosed in
boxes
Do the exercises
Check the answers
If any answers are incorrect, mark through the incorrect answer and write in the correct answer
Move to the next page

Prefixes: in-

A Read the sentences. Fill in the blanks.

1. The stones were set into the gold mounting. The ring had several inset stones.

   Write the word that means "set in." ....

2. If you want to be thin, take less food into your body. What is your daily intake of food?

   Write the word that means "to take in." ....

B Look at the words you wrote in part A.

1. Write the part that is alike in each word. ....
2. *Inset* means .... in.
3. *Intake* means .... in.
4. Write the meaning the prefix *in-* has in these words. ....

C Read the sentences. Fill in the blanks.

1. The party is not formal. It is informal.

   Write the word that means "not formal." ....

2. He is not sincere. He always says that he wants to help. When you need him, he won't help. His offer is insincere.

   Write the word that means "not sincere." ....

D Look at the words you wrote in part C.

1. Write the part that is alike in each word. ....
2. *Informal* means .... formal.
3. *Insincere* means .... sincere.
4. Write two meanings of the prefix *in-*. ....

The prefix *in-* can change a word to mean not, into, or in.

Answers are
on next page

Answers for Page 5

B.
1. *un-*
2. not
3. not
4. not
5. not
6. not

C.
1. not done
2. not certain
3. not like
4. not important
5. not able

D. prefix; beginning; change

E Read each sentence. Then write the meaning of the underlined word.

1. The man was unkind to others. He was just plain mean to people. People said he was inhuman. ....
2. Hansen worked as an offshore oil driller. But he never did like the sea. He was glad when his job moved him inland. ....
3. Dolores was good at getting to know people. She had insight about people's feelings. ....
4. Rich acted strangely. One could never tell what he would do next. People thought he was insane. ....
5. The doctor told Alex to get more exercise. Alex was too inactive. ....
6. Julie's toe hurt very much. She had an ingrown toenail. ....
7. Howard's new boat can go almost one hundred miles per hour. It has a powerful inboard motor. ....
8. The Gamboas were not able to move into their new house when they expected. Some of the trim work was incomplete. ....
9. The weather was very cold, and the snow was several feet deep. Everyone tried to stay indoors. ....
10. Murray failed the written part of the driver's license test. He had one too many incorrect answers. ....
11. Mr. Stevens was afraid to go to the doctor for a checkup. He thought he had an incurable disease. ....
12. Cindy had a lot of confidence in herself. In fact, she thought she was incapable of making a mistake. ....

Answers are
on next page

Answers for Page 7

A.
1. inset
2. intake

B.
1. *in-*
2. set
3. to take
4. in or into

C.
1. informal
2. insincere

D.
1. *in-*
2. not
3. not
4. not, in or into

F Fill in the blanks.

A .... is a word part at the beginning of a word. It may change the .... of the word.

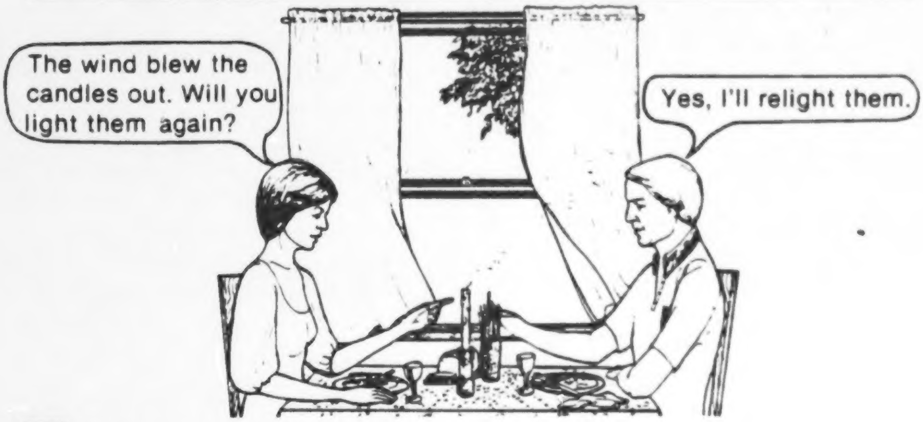
Answers are
on next page

Answers for Page 8

E. Many times the meaning of a word depends partly on the sentence in which it is used. How you write the meaning of a word used in a sentence can depend on what the sentence means to you. Your answers to exercise E should mean the same as one of the suggested answers below, even though you may have used a different word for your answer.

1. mean, unkind, cruel (not human)
2. away from the sea (into the land)
3. ability to see into situations or people (sight into)
4. crazy (not sane)
5. lazy (not active)
6. grown in
7. on board (inside the boat)
8. not done or finished (not complete)
9. inside (in the house)
10. wrong (not correct)
11. fatal or deadly (not curable)
12. not capable

Prefixes: re-


The wind blew the candles out. Will you light them again?
Yes, I'll relight them.

A Read the sentences. Fill in the blanks.

1. Read what the people in the picture above said.

   Write the word that means "to light again." ....

2. Grandpa told the same story time and time again. No one knew how many times he had retold it.

   Write the word that means "told again." ....

3. The store put in an order for my coat last month. It hasn't come in yet, so I will reorder it.

   Write the word that means "to order again." ....

4. Our family had our pictures taken last week. The pictures did not come out well. We will retake them next week.

   Write the word that means "to take again." ....

B Look at the words in part A.

1. Write the part that is alike in each word. ....
2. *Relight* means ....
3. *Retold* means ....
4. *Reorder* means ....
5. *Retake* means ....
6. Write the meaning the prefix *re-* has in these words.

   ....

Answers are on next page

Re- is a prefix. It comes at the beginning of a word. It means **again** or **back**. *Re-* changes the word meaning.

Answers for Page 9

F. prefix; meaning

C Read the sentences. Write the meaning of each underlined word.

1. The sisters had not seen each other in years. They had lived in different countries. They were reunited last week.

   ....
2. Many of the new cars had a bad part. The company had to recall all of them. ....
3. You may use the book while you are here. Be sure to replace it on the shelf before you go. ....
4. Mr. Prince has gone to lunch now. He will return to work in one hour. ....
5. Did you repay your loan? ....

D Fill in the blanks.

1. A word part that can change the meaning of a word is a ....
2. A prefix that means again, or back, is ....

E Write the meaning of each word.

1. rehire ....
2. refuel ....
3. refreeze ....
4. rebuild ....
5. remarry ....
6. retype ....
7. refill ....
8. retrain ....
9. rerun ....
10. remake ....

Answers are on next page

Answers for Page 10

A.
1. relight
2. retold
3. reorder
4. retake

B.
1. *re-*
2. to light again
3. told again
4. to order again
5. to take again
6. again

Prefixes: dis-

A Read the sentences. Fill in the blanks.

1. The man hurt his back in a car wreck. Since then he has been disabled.

   Write the word that means "not able." ....

2. Store *X* put ads in the newspaper about its cheaper prices. But when customers went to Store *X*, the prices weren't cheaper at all. The ads for Store *X* were dishonest.

   Write the word that means "not honest." ....

3. She never did care for green vegetables. In fact, she disliked them.

   Write the word that means "opposite of liked." ....

B Look at the words you wrote in part A.

1. Write the part that is alike in each word. ....
2. Write the meaning of the prefix in each word.

   a. disabled *Dis-* means ....

   b. dishonest *Dis-* means ....

   c. disliked *Dis-* means ....

The prefix *dis-* can change a word to mean not, opposite of, reverse of.

C Read the sentences. Write the meaning of each underlined word.

1. There is a new machine at work. It took the place of five men. The men were displaced. ....
2. The man never got to work on time. When he got there, he did not do his job well. He was a disgrace to the entire company. ....
3. The police moved quickly. They knew that they must disarm the sniper before he hurt someone. ....
4. Almost everything the boy did brought shame on his family. His father said that he would disown him if he couldn't do better. ....

Answers are on next page

Answers for Page 11

C.
1. united (brought together) again
2. call back (as for repair)
3. place back, or put back
4. come back
5. pay back

D.
1. prefix
2. re

E.
1. hire back, or hire again
2. to fuel again
3. to freeze again
4. to build again
5. to marry again
6. to type again
7. to fill again
8. to train again
9. to run again, or something run again
10. to make again, or something made again

Prefixes

A Below are some of the things certain prefixes can mean. Write the meanings beside the correct numbered prefixes. You will need to use some of the meanings more than once. Some of the prefixes have more than one meaning.

not
from
into
away
opposite of
down
again
with
together
back

1. *in-*
2. *un-*
3. *dis-*
4. re-

B Read each word. Underline the prefix. Write a meaning of the word. Write a sentence using the word.

1. discover
2. disorder
3. regrade
4. unable
5. replant
6. unhappy

Answers are on next page

Answers for Page 12

A.

1. disabled
2. dishonest
3. disliked

B.

1. *dis-*
2. a. not
   b. not
   c. opposite of

C.

1. put out of work (opposite of *placed*)
2. shame (opposite of *grace*)
3. to take a weapon away (opposite of *arm*)
4. to refuse to claim as one's own (opposite of *own*)

Prefixes: pre-

A Read these sentences. Fill in the blanks.

1. Be good to your baby before it is born. Give the baby good prenatal care.

   Write the word that means "before birth." ....

2. Some people can tell what will happen before it happens. They can predict the future.

   Write the word that means "tell before." ....

B Look at the words you wrote in part A.

1. Write the part that is alike in each word. ....
2. What is that word part called? ....
3. How does the prefix *pre-* change the meanings of the words?

   ....

4. Write a meaning for *pre-*. ....
5. Look at this word: *prefix*. Draw a circle around the prefix in the word. Why do you think it is called a prefix?

   ....

> The prefix *pre-* changes a word to mean **before**, or **in front of**.

C Read the sentences. Write the meaning of each underlined word.

1. Some jobs are dangerous. Workers should take whatever precautions are necessary to be safe at work.

   ....

2. The material in the front of a book is sometimes very interesting. Get in the habit of reading the preface of a book.

   ....

3. Parents should watch young children closely. They can prevent many injuries to the child. ....
4. It is easy to order things from a catalog. Some orders must be prepaid, though. ....

Answers are on next page

Answers for Page 13

A.

1. into, not
2. not
3. not, opposite of
4. with, together

B. Suggested meanings are given for words. You may have used different words to tell what the words mean. Your sentences will probably be different from everyone else's, so no sentences are shown. The prefix you should have underlined in each word is shown in dark type.

1. **dis**cover—find: to learn of for the first time
2. **dis**order—to disturb; lack of order
3. **re**grade-to grade again
4. **un**able—not able
5. **re**plant—to plant again
6. **un**happy—sad; not happy

Prefixes: anti-

A Read these sentences. Fill in the blanks.

1. Tom wanted to protect his car against freezing. He put antifreeze in the radiator.

   Write the word that means "against freezing."

   ....

2. Sue did not like to be around others. She was opposed to social gatherings. Sue was antisocial.

   Write the word that means "opposed to social."

   ....

B Look at the words you wrote in part A.

1. Write the prefix used with each word. ....
2. *Antifreeze* means .... freezing.
3. *Antisocial* means .... social.
4. When *anti-* is used as a prefix, it means ....

C Read these sentences. Write the meaning of each underlined word.

1. Everyone in the family had the illness. The doctor sent over some medicine that was opposed to the life of the germs causing the illness. He told them to take the antibiotic every four hours. [*anti-* + biotic (life)] ....

2. Janet cut her foot on a broken bottle. Her mother knew that she must put something on the wound. She must use something that would be opposed to decay in the cut. She put antiseptic on the wound.

   [*anti-* + septic (decay)] ....

D The prefix *anti-* can be used on many base words to change their meanings. When the base word begins with a capital letter, *anti-* is separated from the word by a hyphen (-). Write the meaning of each word below.

1. anti-American ....
2. anti-Christian ....
3. anti-Nazi ....

Answers are
on next page

Answers for Page 14

A.

1. prenatal
2. predict

B.

1. *pre-*
2. a prefix
3. It makes them mean "before."
4. before
5. *Pre-* is called a prefix because it comes before the word.

C.

1. something done ahead of time to prevent harm (caution before)
2. remarks in the front of a book or before the main part of a speech
3. to keep from happening (by doing something *before* it happens)
4. paid for before

Prefixes: mis-

A Read the sentences. Fill in the blanks.

1. The socks do not match. One is dark blue and the other is black. They are mismatched.

   Write the word that means "matched wrongly." ....

2. Every time they were left with a sitter, the children behaved badly. The last sitter told their parents that the children misbehave.

   Write the word that means "behave badly." ....

B Look at the words you wrote in part A.

1. Write the prefix used with each word. ....
2. *Mismatch* means match ....
3. *Misbehave* means behave ....
4. Write two meanings of the prefix *mis-*. ....

   ....

C Read these sentences. Write the meaning of each underlined word.

1. Alex has had one bad fortune after another. His life has been full of misfortune. ....
2. Flavio lost his watch. When he took it off, he put it in the wrong place. He misplaced it twice last week.

   ....

3. The prices were wrong on the sale items printed in the newspaper yesterday. The paper has been having many misprints lately. ....
4. Kim had enough money to buy a good used car. But she used it wrongly on other things she didn't even need. She misused her money. ....
5. The man at the health center gave me the wrong information about the shots. He misinformed the other people, too.

   ....

Answers are
on next page

Answers for Page 15

A.

1. antifreeze
2. antisocial

B.

1. *anti-*
2. against
3. opposed to
4. against or opposed to

C.

1. something that kills germs
2. something that stops decay or infection

D.

1. opposed to Americans
2. opposed to Christians
3. opposed to Nazis

Prefixes: semi-

A Read these sentences. Fill in the blanks.

1. The chairs were in a half-circle. The teacher asked the students to sit in a semicircle for a discussion.

   Write the word that means "half-circle." ....

2. Trina goes to the clinic for a checkup twice a year. It is now time for her semiannual checkup.

   Write the word that means "each half-year (twice a year)."

   ....

3. There was a job opening for a partly skilled laborer. The company needed a semiskilled worker.

   Write the word that means "partly skilled." ....

B Look at the words you wrote in part A.

1. Write the prefix used with each word. ....
2. *Semicircle* means ....-circle.
3. *Semiannual* means .... a year.
4. *Semiskilled* means .... skilled.
5. Write three meanings for *semi-*. ....

   ....

C Read these sentences. Write the meaning of each underlined word.

1. They were invited to a party that was somewhat formal. The party was a semiformal event. ....
2. He never did like very sweet foods. He did like semisweet chocolate candy, though. ....
3. The newspaper was neither a daily nor a weekly. It was printed semiweekly. ....
4. The sprinter had won the semifinal. Now he was ready for the final. ....

Answers are
on next page

Answers for Page 16

A.

1. mismatched
2. misbehave

B.

1. *mis-*
2. wrongly
3. badly
4. wrongly, badly

C.

1. bad luck; bad fortune
2. lost; placed wrongly
3. a mistake in printing
4. used in a wrong way
5. gave wrong ideas or information to

Prefixes: post-

A Read these sentences. Fill in the blanks.

1. After the war, jobs were hard to find. Postwar unemployment rates were high.

   Write the word that means "after the war." ....

2. Shortly after his birth, the baby became ill. He had a postnatal illness.

   Write the word that means "after birth." ....

B Look at the words you wrote in part A.

1. Write the prefix used with each word. ....
2. *Postwar* means .... the war.
3. *Postnatal* means .... birth.
4. When *post-* is used as a prefix, it means ....

C Read these sentences. Write the meaning of each underlined word.

1. The bank would not cash my check. It was dated for the day after tomorrow. The bank won't cash postdated checks.

   ....

2. Since it rained today, the meeting was placed after next week. It was postponed until the third Saturday of the month.

   [*post-* + pone (to place)] ....

3. The doctor examined the body after the man's death. She did a postmortem examination.

   [*post-* + mortem (death)] ....

4. Carolyn went back to school after she graduated. She did postgraduate work. ....
5. Paul had problems after his operation. He had a postoperative infection. ....

Answers are on next page

Answers for Page 17

A.
1. semicircle
2. semiannual
3. semiskilled

B.
1. *semi-*
2. half
3. twice
4. partly
5. half; twice; partly

C.
1. partly formal
2. partly sweet
3. twice weekly
4. a race that comes just before the final one

Prefixes: super-

A Read these sentences. Fill in the blanks.

1. Tony seems to think that he is so far above everybody else. He thinks that he is superior.

   Write the word that means "above others of the same kind."

   ....

2. Several people said that they had seen the creature. His size was above that of any human. He also had superhuman strength.

   Write the word that means "over or above human."

   ....

B Look at the words you wrote in part A.

1. Write the prefix used with each word. ....
2. *Superior* means ....
3. *Superhuman* means ....human.
4. When *super-* is added to a base word, it means ....

   or ....

C Read these sentences. Write the meaning of each underlined word.

1. This highway is huge. It has ten lanes. It is a superhighway.

   ....

2. The animals were uneasy. When the farmer came out to see about them, he heard a supernatural sound.

   ....

3. The jet could travel faster than the speed of sound. It was a supersonic airplane.

   [*super-* + sonic (sound)] ....

4. The corner store was having a hard time. The customers were going to the new supermarket. They said that they could find everything they needed there.

   ....

5. For each twenty workers on the job, they hire one person to supervise. [*super-* + vise (to see)] ...

Answers are on next page

Answers for Page 18

A.

1. postwar
2. postnatal

B.

1. *post-*
2. after
3. after
4. after

C.

1. dated for a day after the present one
2. put off until later
3. taking place after death
4. after graduation
5. after an operation

Prefixes: bi-

A Read these sentences. Fill in the blanks.

1. The money for the lease on our house is due every two months. We pay lease money bimonthly.

   Write the word that means "every two months."

   ....

2. The flower has two colors. Its petals are bicolored.

   Write the word that means "two-colored." ....

B Look at the words you wrote in part A.

1. Write the prefix used with each word. ....
2. *Bimonthly* means every .... months.
3. *Bicolored* means ....-colored.
4. When *bi-* is used as a prefix, it means ....

C Read these sentences. Write the meaning of each underlined word.

1. The family got a gift for Mary's fifth birthday. They hid it outside and told her to guess what they had. They said, "You can ride on it. It only has two wheels." Mary shouted, "It's a bicycle!" [*bi-* + cycle (wheel)] ....
2. This plant takes two years before it blooms. Then it dies. It is a biennial. [*bi-* + ennial (year)] ....
3. The United States has two main political parties. The political system is bipartisan.

   [*bi-* + partisan (to divide)] ....
4. There is a service station where Interstate 5 crosses Interstate 90. Interstate 5 bisects the other highway there.

   [*bi-* + sect (cut)] ....
5. People have two feet. An animal with two feet is called a biped. [*bi-* + ped (foot)] ....
6. Benjamin Franklin invented eyeglasses that let people focus their eyes on things both near and far away. Many people today need bifocals. ....

Answers are
on next page

Answers for Page 19

A.
1. superior
2. superhuman

B.
1. *super-*
2. above
3. over or above
4. over; above

C.
1. a large highway
2. beyond natural
3. faster than the speed of sound
4. a large food store
5. to oversee; be in charge

Prefixes: tri-

A Read these sentences. Fill in the blanks.

1. The flag of the United States has three colors. It is a tricolor flag.

   Write the word that means "three-colored." ....

2. The con man told the pensioner to invest her money with him. "You'll get it back threefold in a year," he said. "You can't lose. You'll triple your money with me."

   Write the word that means "threefold." ....

B Look at the words you wrote in part A.

1. Write the prefix used with each word. ....
2. *Tricolor* means ....-colored.
3. *Triple* means .... fold.
4. The prefix *tri-* means ....

C Read these sentences. Write the meaning of each underlined word.

1. The stand for the camera has three feet. It is called a tripod.

   ....

2. The man at the Social Security office told Joe to make three copies of each form. Each form must be filed in triplicate.

   ....

3. He wanted a bicycle, but his parents said he was too little. They got him a three-wheeler instead. They got him a tricycle. ....
4. Betsy drew a figure with three sides and three angles. She drew a triangle. ....
5. Our flight will be on a Boeing 727, a plane with three jet engines. It is a trijet. ....
6. Mrs. Marsh has a small stand with three feet that she sets hot pans on. She sets the pans on a trivet. ....
7. The Howards live in a building that has three apartments. They live in a triplex. ....

Answers are on next page

Answers for Page 20

A.

1. bimonthly
2. bicolored

B.

1. *bi-*
2. two
3. two
4. two

C.

1. a two-wheeled cycle
2. a plant that lives for two years
3. made up of two political parties
4. cuts into two parts
5. an animal with two feet
6. eyeglasses for seeing both near and far away (at two distances)

Prefixes: non-

A Read these sentences. Fill in the blanks.

1. The woman was running for president of the United States. She said that her actions as president would have nothing to do with a political party. Her actions would be completely nonpartisan.

   Write the word that means "the absence of parties."

   ....

2. The Other Guys Tire Company is putting out a new tire this year. They say that it will not skid, even on wet roads. The tire is a nonskid model.

   Write the word that means "not skid." ....

B Look at the words you wrote in part A.

1. Write the prefix used with each word. ....
2. *Nonpartisan* means the .... of parties.
3. *Nonskid* means .... skid.
4. When *non-* is used as a prefix, it can mean .... or ....

C Read these sentences. Write the meaning for each underlined word.

1. The group did not want to make a profit from people. It was a nonprofit organization. ....
2. What you said makes no sense at all. That's just nonsense.

   ....

3. Lenny asked for a ticket on the plane that made no stops between New York and Boston. He took the nonstop flight.

   ....

4. Soon after Jim left town, he stopped sending money for the children. Marge told a lawyer that Jim gave no support for the children. She plans to sue Jim for nonsupport.

   ....

Answers are on next page

Answers for Page 21

A.
1. tricolor
2. triple

B.
1. *tri-*
2. three
3. three
4. three

C.
1. a stand with three feet
2. made in three copies
3. a three-wheeled cycle
4. a figure with three sides and three angles
5. a plane with three jet engines
6. a stand with three feet used for holding hot dishes
7. a building with three apartments

Prefixes: en-

A Read these sentences. Fill in the blanks.

1. The Smiths plan to close in their carport. When they enclose it, they will have a den.

   Write the word that means "close in or within."

   ....

2. There was a heavy fog at the bottom of the hill. The car seemed to be wrapped up in fog. It was enveloped in the heavy mist.

   Write the word that means "wrapped up in." ....

B Look at the words you wrote in part A.

1. Write the prefix used with each word. ....
2. *Enclose* means to close .... or ....
3. *Enveloped* means wrapped up ....
4. The prefix *en-* can mean .... or ....

C Read these sentences. Fill in the blanks.

1. The young driver was not careful. He caused the lives of the others in his car to be in danger. His driving endangered the lives of others.

   Write the word that means "caused to be in danger."

   ....

2. The father's nagging always made the boy mad. He was enraged at his father's tone of voice.

   Write the word that means "caused to be in rage."

   ....

D Look at the words you wrote in part C.

1. Write the prefix used with each word. ....
2. *Endanger* means .... danger.
3. *Enrage* means .... rage.
4. The prefix *en-* can mean ....

Answers are on next page

Answers for Page 22

A.

1. nonpartisan
2. nonskid

B.

1. *non-*
2. absence
3. not
4. absence; not

C.

1. not intended to make a profit
2. words with no meaning or sense
3. without a stop
4. failure to send money

E Read these sentences. Fill in the blanks.

1. Julian provided Roberto with the help necessary to fix his car. Julian enabled Roberto to fix the car.

   Write the word that means "provided with the ability."

   ....

2. The teacher's kind words helped Mark. They provided him with the courage to try to learn. The teacher encouraged Mark.

   Write the word that means "provided with courage."

   ....

F Look at the words you wrote in part E.

1. Write the prefix used with each word. ....
2. *Enable* means .... ability.
3. *Encourage* means .... courage.
4. The prefix *en-* can mean ....

G Read these sentences. Write the meaning of each underlined word.

1. Everything you learn will cause your life to be richer. Learning enriches your life. ....
2. Mr. Jones wants to make his store larger. He plans to enlarge it next month. ....
3. The young man did many kind things for people. His good works endeared him to everyone. ....
4. The party was dull. Someone said, "Some good music will give life to this party." The music did enliven the party. ....
5. The teacher said that my name was not on the roll. I forgot to enroll for the class. ....
6. The lawyer kept asking the man questions. He wanted to trap the man in his own words. The lawyer wanted to entrap the man. ....

H Write three meanings for the prefix *en-*.

Answers are on next page

Answers for Page 23

A.
1. enclose
2. enveloped

B.
1. *en-*
2. in; within
3. in
4. in; within

C.
1. endangered
2. enraged

D.
1. *en-*
2. cause to be in
3. cause to be in
4. cause to be in

Prefixes

A Match each prefix with its meaning(s).

.... 1. *semi-*

.... 2. *post-*

.... 3. pre-

.... 4. *super-*

.... 5. un-

.... 6. anti-

.... 7. *bi-*

.... 8. *tri-*

.... 9. *non-*

.... 10. *en-*

.... 11. *mis-*

a. after

b. absence of

c. two

d. half, partly

e. not

f. wrongly, badly

g. cause to be, within

h. after

i. against, opposed to

j. three

k. superior to, over, above

B Circle the word which best completes each sentence.

1. Minnesota and Oakland will play in the (semibowl, superbowl) next Sunday.
2. The teacher was sick, and the principal taught the class in her (absence, nonsense).
3. We will go to the game and attend a (bigame, postgame) party that night.
4. Cheryl had a dangerous (nonadventure, misadventure) on her way to work.
5. A thermometer which uses two strips of different metals to measure temperature is a (bimetal, trimetal) thermometer.
6. Felix is going to buy a fence to (enclose, inclose) his property.
7. Henrietta got the paint cheap because it was (mismixed, postmixed).

Answers are
on next page

Answers for Page 24

E.
1. enabled
2. encouraged

F.
1. *en-*
2. provide with
3. provide with
4. provide with

G.
1. causes to be richer (makes better)
2. cause to be larger (make bigger)
3. caused to be dear or well liked
4. give life to (make more fun)
5. become a member (put one's name on a list)
6. to get into trouble by tricking

H. in or within; cause to be in; provide with

You are now ready to review this unit, after which you will demonstrate your mastery of the unit to your proctor.

When you have demonstrated mastery of this unit, you will be ready to move on to the next unit.

Go to the next page

Answers for Page 25

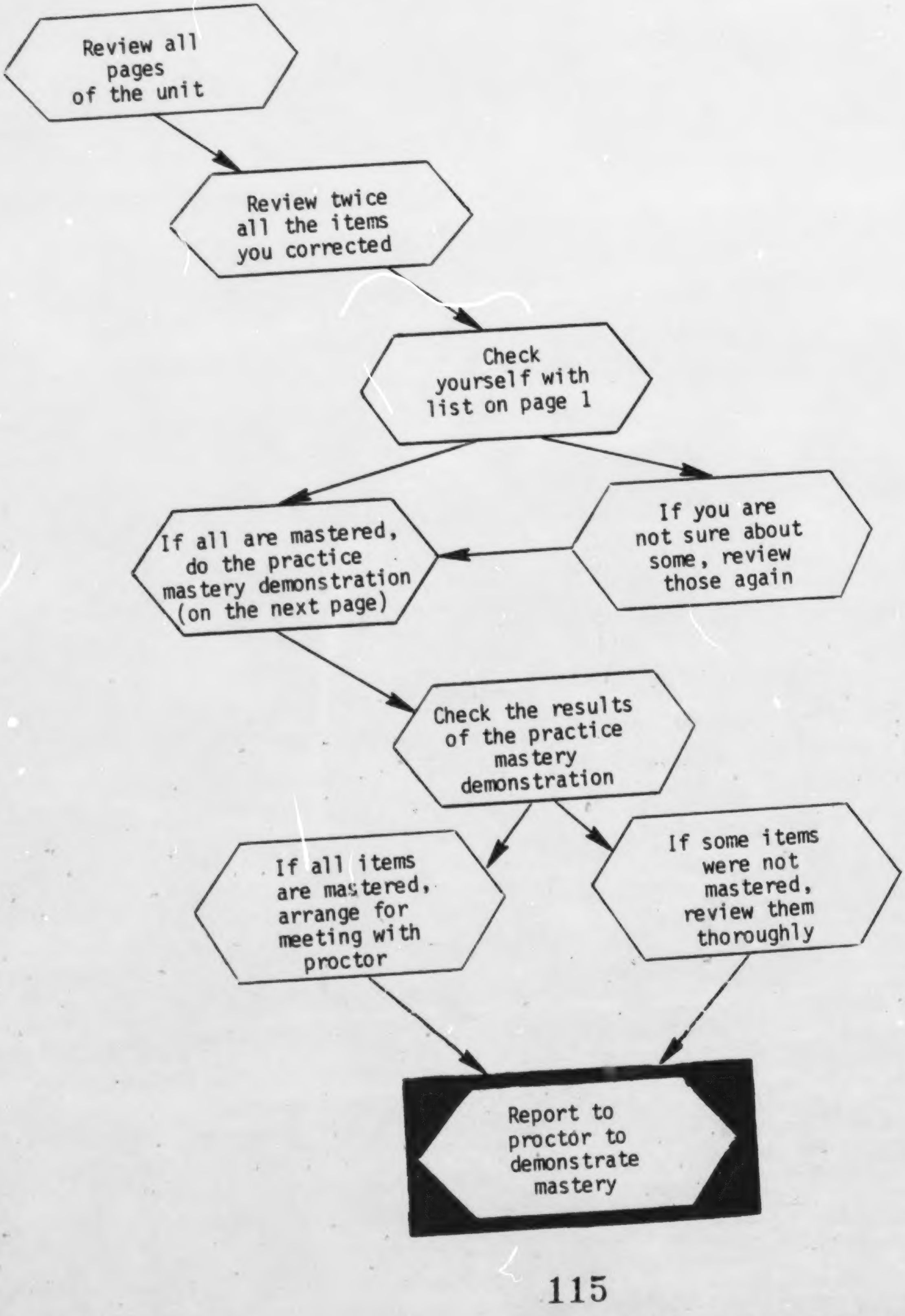
A.

1. d
2. h
3. a
4. k
5. e
6. i
7. c
8. j
9. b
10. g
11. f

B.

1. superbowl
2. absence
3. postgame
4. misadventure
5. bimetal
6. adjoins
7. mismixed

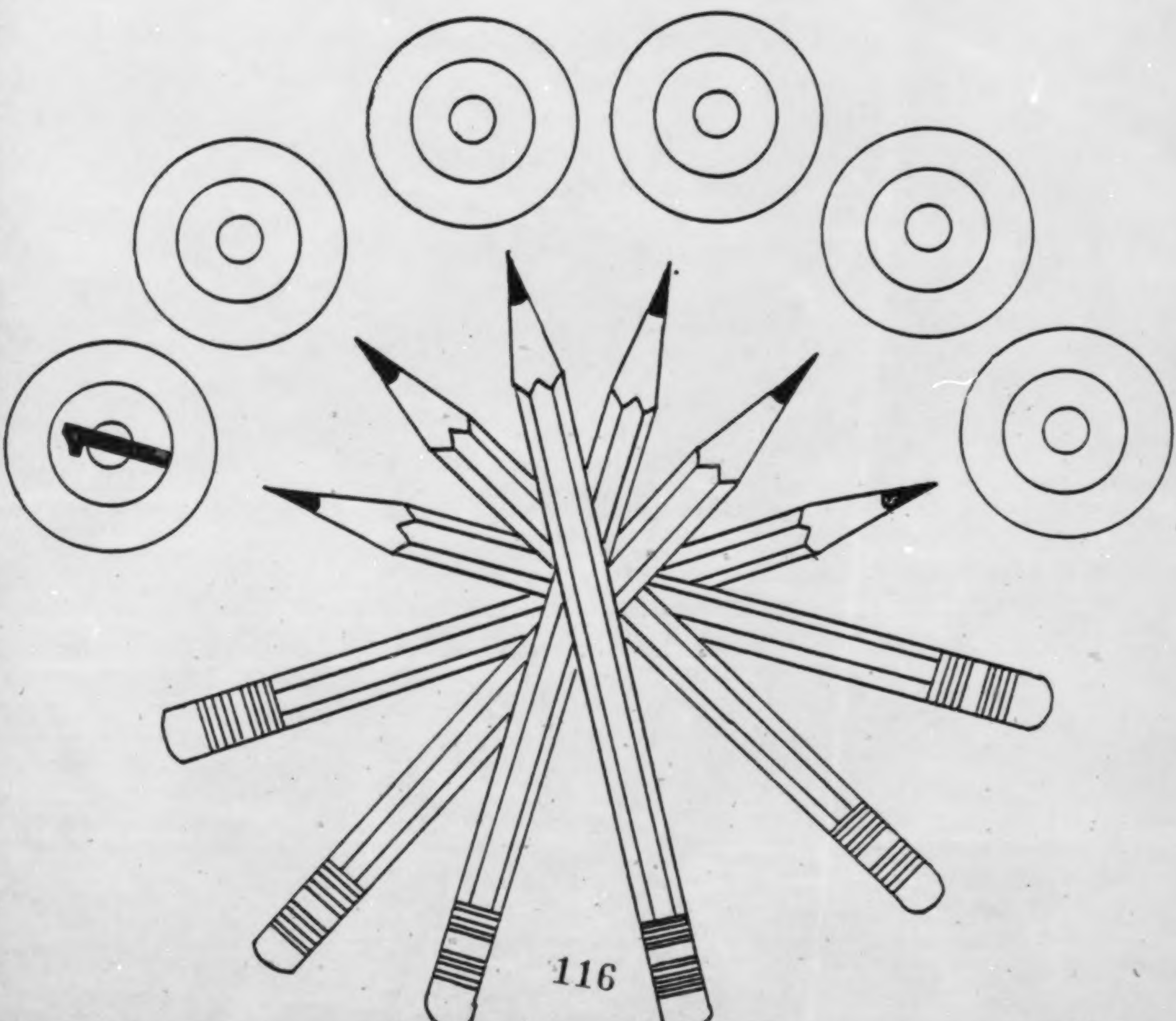
REVIEW STRATEGY


Review all pages of the unit
Review twice all the items you corrected
Check yourself with list on page 1
If all are mastered, do the practice mastery demonstration (on the next page)
If you are not sure about some, review those again
Check the results of the practice mastery demonstration
If all items are mastered, arrange for meeting with proctor
If some items were not mastered, review them thoroughly
Report to proctor to demonstrate mastery

PRACTICE LANGUAGE MASTERY DEMONSTRATION

MODULE I

Unit 1

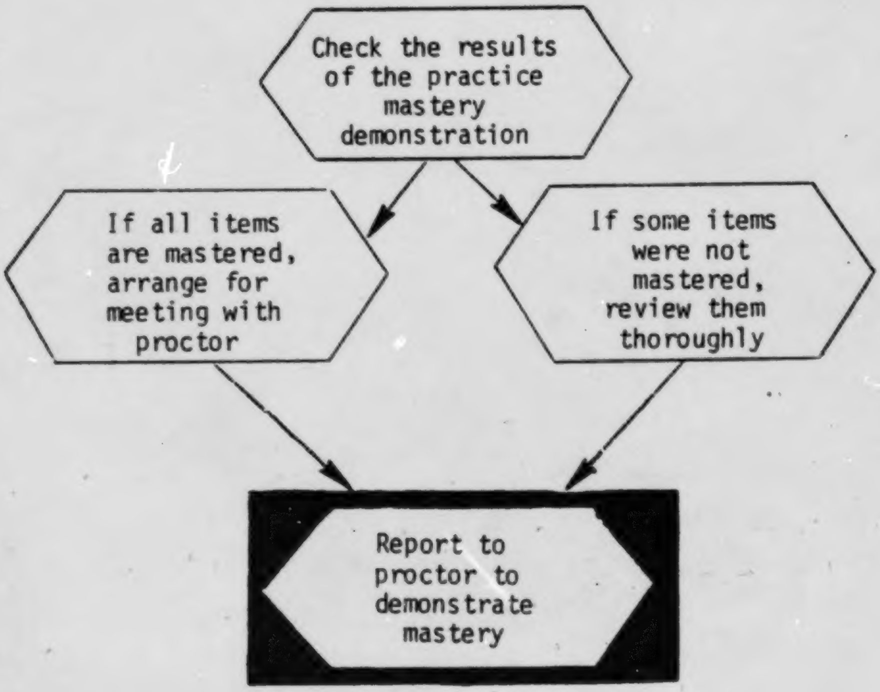


PREFIXES

Write in the meaning of each of the following words in the blank after the word.

1. semicircle ____________________
2. rehire ____________________
3. misuse ____________________
4. superhuman ____________________
5. antifreeze ____________________
6. triplicate ____________________
7. unkind ____________________
8. prepaid ____________________
9. postdated ____________________
10. nonstop ____________________
11. disliked ____________________
12. bimonthly ____________________
13. endanger ____________________
14. informal ____________________

Answers are
on next page


Check the results of the practice mastery demonstration
If all items are mastered, arrange for meeting with proctor
If some items were not mastered, review them thoroughly
Report to proctor to demonstrate mastery

Answers for page 29

1. half circle
2. hire again
3. use in a wrong way
4. over or above (or more than) human
5. against freezing
6. made in three copies
7. not kind
8. paid for before
9. dated for a later time
10. without a stop
11. did not like (or not liked)
12. every two months
13. cause to be in danger
14. not formal

Appendix D

Example of an Unacceptable Posttest

2 Prefixes

Name ....

Kim wrote a triglug word on the board. three-syllable

We are going to be working with prefixes, word parts added to the beginnings of words to change their meanings. Look at the example in the box. The meaning of the underlined nonsense word has been filled in using the information at the bottom of the page. Do the rest of the page the same way.

1. Maria feels very antibol this week. ....
2. Mr. Levy miskiber the address on the letter.

   ....

3. Don prejeked the election outcome. ....
4. The bill was marked with a tripir symbol in one corner.

   ....

5. Fred and Jim stopped by for a postbol game of handball.

   ....

Prefixes	Nonsense Words	Meanings
anti-, dis-,	meb	to form
ex-, mis-,	kiber	to put
post-, pre-,	pir	small dot
pro-, semi-,	bol	work
tri-	jeked	judged
	dely	to move
	glug	syllable
	tarn	a game
	kevy	long walk

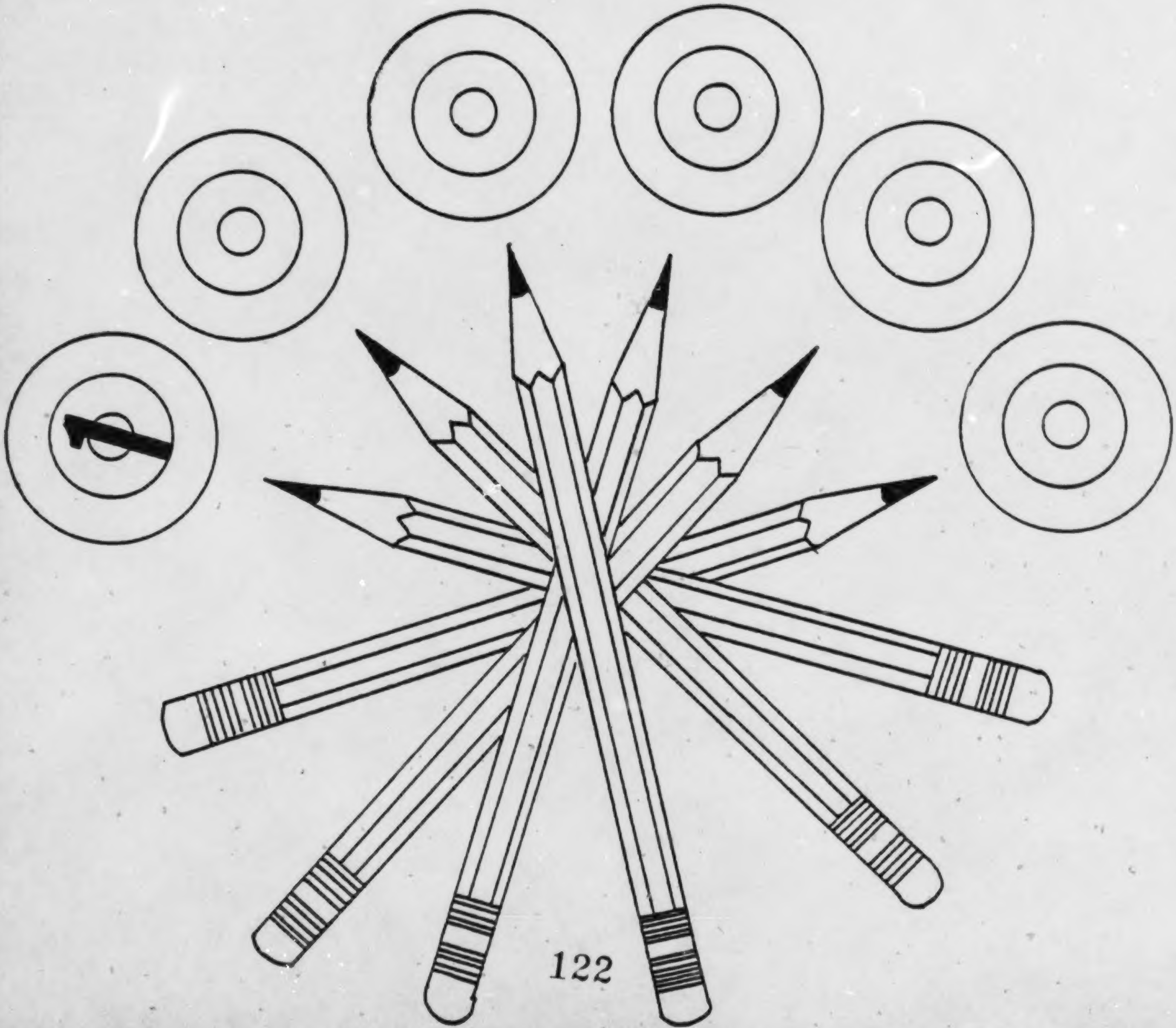
Appendix E

Example PSI Mastery Demonstration Instrument

LANGUAGE MASTERY DEMONSTRATION

MODULE I

Unit 1



Write in the meaning of each of the following words in the blank after the word.

1. supermarket ____________________
2. enclose ____________________
3. insincere ____________________
4. misfortune ____________________
5. nonsupport ____________________
6. dishonest ____________________
7. antisocial ____________________
8. remarry ____________________
9. postwar ____________________
10. triplex ____________________
11. semiskilled ____________________
12. bicolored ____________________
13. unclear ____________________
14. prevent ____________________

Appendix F

Answer Sheet for Mastery Instrument

Answers to Language Mastery Demonstration - Module I Unit 1

12 CORRECT RESPONSES DEMONSTRATES MASTERY

1. a large market (or large food store)
2. close in
3. not sincere
4. bad fortune (or bad luck)
5. fail to provide support
6. not honest
7. not social (or opposed to social)
8. to marry again
9. after the war
10. a building with three apartments
11. partly skilled
12. two-colored
13. not clear
14. to keep from happening

Appendix G

Instructions for PSI Classroom Manager

Instructions for PSI Classroom Manager

Instructions for PSI Classroom Manager

The Personalized System of Instruction (PSI) is an instructional approach that places emphasis on:

1) Self-instructional materials.
2) Mastery of one unit of instruction before moving on to the next unit.
3) Student self-pacing.
4) Use of peer proctors for assisting students and determining mastery.
5) Use of classroom activities to motivate students.
6) Use of an expert in the subjects being taught, to provide classroom management, to assist students with special needs, and to provide feedback and assistance to those responsible for the instructional materials.

The present program is a language and math program for adult students who are functioning at about the 4-8 grade level. Students who are functioning below or above this level will need to be provided with appropriate instruction by the teacher.

The following materials will be supplied:

1) Instructional materials.
    a) Language: five modules of six units each.
    b) Math: five modules of five units each.
    c) Student instruction booklets.
2) Mastery demonstration instruments:
    a) One for each of the 30 language units.
    b) Two (Form A and Form B) for each of the 25 math units.
3) Correct responses for the mastery demonstration units.
4) Tennessee Self-Concept Scale booklet.
5) Tennessee Self-Concept Scale response sheets.
6) ABLE instructor's manual.
7) ABLE response sheets.
8) Proctor instructions.
9) Potential proctor forms.
10) Student Record Forms.
11) End-of-Module student certificates.
12) Notebook for comments to researchers.

Following is an outline of the activities that should take place in the class. The activities are, in general, listed in the order in which they should occur.

1) Tell the students that they are participating in research to find better ways for adults to learn. Data, such as their test scores and progress through the program will be used by the researchers; however, no student will be identified by name in the report on the research. Individual student's identity will be kept strictly confidential. A student does not have to participate if he or she does not wish to, but we certainly hope and expect that all will want to. They have much to gain and nothing to lose.

2) Administer the Tennessee Self-Concept Scale to all of the students. Read the items to the students as a group from the booklet that is provided. The researchers will score these instruments.

3) Administer the ABLE test in Reading and Arithmetic (Tests 2, 4A and 4B only). Be sure to tell the students not to be discouraged if they have trouble with the test. While we want them to do their best, the test is quite advanced and represents the kind of questions we would expect them to answer only after they have been in class for one or more quarters. But we need to test them now so that when we retest them later, we will know how much they have learned.

4) Score the ABLE tests. If a student gets 35 or more items correct on the reading test, he or she is ready to begin the language portion of the PSI program. If they get 30 to 34 correct let's get together and decide what will be best for them. If they get less than 30 correct, they are not ready for the PSI program and you will need to teach them separately.

   On the Arithmetic, Part A: Computation Test, if the students get 7 items correct (and if they passed the reading test), they are ready for the math portion of the PSI program. If they get at least one item correct, but not seven, let's get together and decide what math program will be best for them. If they do not get any items correct, you will need to provide them with math instruction separately.

   NOTE: The answer sheet for scoring the ABLE is included as the last page of this booklet.

NOTE: Keep the ABLE tests. The researchers will need to review them.

5) For those students who are ready for PSI (either language or language and math), pass out the unit entitled What is PSI?

6) When a student completes What is PSI?, give him/her a copy of Module I, Unit 1 of the Language series.

7) When the first student completes Module I, Unit 1, you will have to administer the Mastery Demonstration. Note on the Student Record Form for that student that he or she has taken the mastery demonstration. Also list the date and whether or not they demonstrated mastery.

8) If they do not demonstrate mastery, they will have to restudy the unit. Do not let them take the mastery demonstration twice in the same day. Make them wait at least one day.

9) When the first student does demonstrate mastery, note this on that student's Student Record Form and enter that student's name in the appropriate place on the appropriate Proctor List. This proctor list should be posted where all students have access to it. This student now can (a) assist other students who may be having trouble with that unit, (b) administer the mastery demonstration to students for that unit, and (c) procede with the next language unit and with the first math unit.

10) In general, assistance to a PSI student should be provided by another student who has completed the unit the student needs help with. You should provide assistance only when there is no one else to help or if the proctor says he or she cannot help because they do not know the answer. (You will then be freed up to focus your attention on program management and on students with special needs. Also the students will learn by helping others.)

11) Keep notes for the researchers in a notebook that they will provide. Provide information such as: What went wrong today? What went right? Are there problems with the instructional materials? What problems? How are the students reacting? Are they spending most of their time on task, or are they just "visiting?"

12) Remember that you will keep several records for the researchers. They will need:

a) The ABLE tests.

b) The Tennessee Self-Concept Scales.

c) The copies of the Student's Mastery Demonstrations.

Also, they will need to review occasionally:

a) Your Student Record Forms.

b) The Proctor lists.

c) Your note book of comments.

13) Students are allowed to take instructional materials home with them; however, warn them not to lose them or accidently leave them at home. We have only a limited number of copies and a very tight budget. The students are allowed to keep the instructional materials once they finish with them. They may not keep the mastery demonstration instruments. The researchers need these. Students may get help with a unit outside of class. But they must do the mastery demonstration in class without assistance.

14) When a student takes a math mastery demonstration, be sure to note on the Student Record Form whether he or she used a Form A or a Form B. If they do not demonstrate mastery using one form, be sure they use the other form the next time.

15) When a student completes an entire Module, you will present them with a Certificate of Completion.

16) When a proctor needs to give a mastery demonstration to a student, check the student's Student Record Form to make sure it is the correct instrument. Give the proctor the instrument, the answer sheet and the Proctor Guide. Make sure you get all of these back as soon as the proctor has finished with them. Keep the answer sheets in the three-hole binders that are provided.

17) Try to encourage all the eligible proctors to serve as proctors. One or two students should not have to do all the work.

18) The researchers are J. Lamarr Cox whose telephone number is 541-6326, and Carolee Lane whose telephone number is 541-6460. Telephone us if you need help. We will keep in close touch anyway, particularly in the beginning.

19) We will add more to this list as we learn what is working and what is not working. But, hopefully, this will get us started.

Appendix H

Proctor Guide

PROCTOR GUIDE

When you have been asked to proctor:

1 Get the correct MASTERY DEMONSTRATION tool from the teacher.

2 Give it to the student. Stay nearby while student takes it, in case there are questions.

3 Feel free to do your own work while your student takes the MASTERY DEMONSTRATION.

---

4 You may answer questions about how to take the MASTERY DEMONSTRATION but don't help your student with the answers.

5 Make sure your student uses only the mastery demonstration booklet and blank scratch paper (if needed). No other materials should be used during a mastery demonstration.

6

Score the MASTERY DEMONSTRATION using the answer key. Written answers do not have to be exactly the same as the answer key but they must mean the same thing.

7

If your student is successful in demonstrating mastery, report that success to the teacher so that it will be recorded.

8

If your student is not able to demonstrate mastery, be encouraging. It is important that your student understand that he/she has not failed but only needs to study the unit to little longer. Offer to answer questions or help if you think it necessary. Some students will need some extra help, some will only need to study more.

9 Do not let your student take a second MASTERY DEMONSTRATION on the same day as he/she had trouble with the first one. Have the student wait at least one day before trying again.

10 If you have problems or questions, ask the teacher for help.

11 If your student finishes a full module (one module = 5 units) he/she should receive congratulations from you and a certificate from the teacher.

12 Check to make sure your student gets the correct unit to study next after the one you proctored.

THANK YOU FOR YOUR VALUABLE HELP IN MAKING THIS PSI PROGRAM WORK. IF YOU HAVE ANYTHING TO SAY ABOUT YOUR PROCTORING EXPERIENCE, FEEL FREE TO WRITE IT ON THE BLANK PAGES AT THE BACK OF THIS BOOKLET.

Appendix I

Student Record Form

STUDENT RECORD FORM

Student's Name ______________________________

Student Activity	Results	Date

Appendix J

Example Proctor List

LANGUAGE PROCTORS FOR MODULE I

Unit 1 Prefixes	Unit 2 Suffixes	Unit 3 Synonyms/ Antonyms	Unit 4 Homophones	Unit 5 Multiple Meanings	Unit 6 Selected Readings

Appendix K

Student Questionnaire

Your Name ________________________ Date ____________

- Did you have any problems with this unit?

  Yes ☐ No ☐

  If "Yes," briefly write what the problems were. (IF YOU NEED MORE SPACE, CONTINUE ON THE BACK OF THE PAGE.)

  ____

  ____

  ____

- Was the unit too easy?

  Yes ☐ No ☐

- If you had not studied the unit, do you think you still could have successfully completed the MASTERY DEMONSTRATION?

  Yes ☐ No ☐

- About how many hours (both in class and out of class) did you spend studying this unit?

  ________ Hours

- Which proctor is giving you the MASTERY DEMONSTRATION?

  ________________ Proctor's Name

- Did a proctor help you while you were studying the lesson?

  Yes ☐ No ☐

  If "Yes," what were the proctors' names and about how many minutes did each of them spend helping you?

  ________________ Proctor's Name ________ Minutes

  ________________ Proctor's Name ________ Minutes

  ________________ Proctor's Name ________ Minutes

- Did anybody outside of the class help you with this unit?

  Yes ☐ No ☐

  If "Yes," about how many minutes did they spend helping you?

  ________ Minutes

- How helpful do you think this unit will be to you?

  Not helpful at all ☐

  Not very helpful ☐

  Somewhat helpful ☐

  Very helpful ☐

Appendix L

Example Certificate

This MASTERY AWARD certifies that

____

has mastered Language Module I of the
Personalized System of Instruction (PSI) Program
of

More specifically, the above-named has mastered, and thus is qualified to proctor, the following language skills: (1) the use of prefixes; (2) the use of suffixes; (3) the use of synonyms/antonyms; (4) the use of homophones; and (5) the ability to choose the correct meaning of words that are spelled and pronounced the same.

Approved by:

____

____